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ERYTHEA

A JOURNAL OF BOTANY, WEST AMERICAN AND GENERAL.

EDITED BY

WILLIS LINN JEPSON

AND OTHERS, OF THE DEPARTMENT OF BOTANY,
UNIVERSITY OF CALIFORNIA.

VOLUME II.

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CONTENTS:

PAGE
Californian Field Notes—I., . *Anstruther Davidson, M. D.* 1
R. & P., ... *C. Michener* 3
Dr. Britton, Mr. Britten, and Jacksonia, *Edward L. Greene* 6
Californian Herb-Lore.—III, . . . *Ida M. Blochman* 9
Open Letters.—Another side of the nomenclature question, . 10
Correct nomenclature, etc., ... 12
Publication of varieties, ... 13
Teratological Notes, ... 14
Miscellaneous Notes and News, ... 15

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ERYTHEA

A MONTHLY journal of Botany, edited by members of the Department of Botany at the University of California. Devoted to every department of botanical investigation and criticism. . . Historical papers, general articles on systematic and geographic botany, biographical sketches, and reviews of new literature, will continue to be features of the journal.

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CALIFORNIAN FIELD NOTES.—I.

By ANSTRUTHER DAVIDSON, M. D.

Calochortus.

In the Botany of California Mr. Watson grouped the Mariposa lilies proper under this heading:

Flowers and fruit erect on stout pedicels: flowers open-campanulate: gland usually densely hairy: capsule (except in C. Greenei) narrowly oblong, with thick lobes, acute, septicidal: sepals often hairy or subglandular or spotted within: seeds ascending and somewhat turgid, with white loose and spongy minutely tessellated testa.

In this group all the upright Mariposas are included except *C. Catalinœ*, which he has very properly. I think separated under the following subdivision.

Fruiting pedicels erect: capsule narrowly oblong, obtuse, loculicidally dehiscent at the summit: seeds flat and horizontal, in one row in each cell, with close white testa.

These definitions, apart from the character of the seeds, which I have not had the opportunity of examining in all the species, separates *C. Catalinœ* on account of the capsule which Watson describes as obtuse and loculicidally dehiscent at the summit. This dehiscence is apparently limited to the part forming the apex of the obtuse capsule and, while well marked, is not peculiar to this species; the same mode of dehiscence occurring in *C. Weedii, var. purpurascens.*

It is likewise very frequent in *C. Kennedyi*, and probably so in all our South Californian species, unless *C. luteus* and *clavatus* are to be excepted, as having beaks too firm and acute to readily split in this manner.

In *C. Catalinœ* the seeds are as described by Watson; flat and horizontal with close white testa. The circular pits that look like nuclei in the centre of the pavement epithelium forming the outer coat of the testa are very distinct. This pitting though not so distinct is also present in *C. flexuosus;*

ERYTHEA. Vol II. No. 1. [2 January, 1894].

but the loose testa in this plant readily prevents any confusion. In *C. Kennedyi* the seeds appear to me to be always horizontal, and of a somewhat similar shape to those of *C. Catalinæ*, so that this supposed characteristic may also be eliminated.

Since the publication of the Californian State Survey Botany a new species has been added to this family, and, while I have not seen Gray's description of it, I am quite familiar with the plant. It is our earliest and most common Mariposa at Los Angeles, and was named *C. Lyoni* in honor of its discoverer.

While at Catalina this season I collected numerous specimens of *C. Catalinæ* and compared them in flower and fruit with *C. Lyoni*, and have no hesitation in pronouncing them to be of the same species. As *C. Catalinæ* antedates *C. Lyoni* by some years it will naturally take precedence. In accordance with the analysis detailed above, the following subdivision and description may prove more accurate.

Fruiting pedicels erect: capsule oblong, obtuse: seed with close white testa.

CALOCHORTUS CATALINÆ, Wats. Proc. Amer. Acad. xiv. 268. Bot. Cal. 1878: *C. Lyoni*, Gray. Stem 2 feet high, branching, from a small oblong-ovate fibrous-coated corm: leaves and bracts narrowly linear: flower open-campanulate, petals lilac in varying shades, 1½ to 2 inches long and 1 to 1½ inches wide; the claw and lower segment purple for a half inch; gland oblong, brown, with hairs of a lighter hue either limited to the cushion or scattered over the whole spot; sepals with a variable acute purple spot at base: stamens flesh-colored, and dehiscing in threes; filaments purple in the upper two-thirds; capsule triangular, winged, very obtuse at base and apex; 1 to nearly 2 inches long, 4 to 6 lines wide: loculicidally and septicidally dehiscent: seeds nearly orbicular, thin and very numerous; testa minutely pitted: stem bulbiferous. First discovered on Catalina Island, but common on the mainland on the lower hills; at Los Angeles abundant, in the Elysian Park; flowering in April or May; one of our earliest wild flowers, and the first Mariposa of the season.

R. & P.

By C. Michener.

It is not difficult for me to remember back to the time when I really wondered what the initials that head this note signified. For I confess to a tendency even to leaving them (in common with many, many others) entirely aside in the consideration of the plant-names of which now they form a part to me. *Bowlesia lobata R. & P.* I had seen that term often, but it was long before the R. & P. part of it meant anything to me. But of late I have looked more closely at this part of names, and their meaning has increased for me.

And though, in the present case, the results I have to offer are but meagre, yet I was glad to know them, and so I think others may be.

On the 4th of November, 1777, there sailed from Spain a ship called "Peruano." It had been equipped by a king who had much interest in botany and other sciences taken for him by his advisors; and really Carlos III. of Spain was no sparer either of men or money when it was a question of obtaining information about his provinces. His provinces—that meant a goodly share of the unexplored world in those days. And so this ship sailed, and it contained among other people some men called as follows: Hypolito Ruiz, Joseph Pavon — these Spanish botanists — and Joseph Dombey, botanist to the King of France. And they took with them skillful artists; for in those days each plant was carefully drawn as it grew. I think the artists' names are worth noting: Joseph Brunete and Isidro de Galvez.

At that time a voyage to Peru meant something, for it was not until the 8th of April, 1778, that they arrived at Callao.

They spent eleven years in the country, going first to Lima and the Province of Chancay, at Lurin, Surco, then back to Lima, whence they sent to Spain three hundred species of dried plants and two hundred and forty-two drawings made from the living plants. The next excursion was made to Tarma, where they separated, Dombey going to Cheuchin and Pavon to Talca. Back to Lima again and then a long expedition to Huacanuco, Chinchao and Cuchero. On their return to Lima from this trip the party seem to have all reunited and together made their way to Chile, landing at Talcuano. In Chile they explored the Districts of Concepcion, Itata, and Arauco, and the Provinces of Puchacay, Maule, San Fernando, Rancagüa, Santiago and Quillota. This Chilian expedition consumed two years, and its fruits were fifty-six boxes of plants, which were started on their way to Spain, and lost by shipwreck on the coast of Portugal. But fortunately most of them were duplicated in the collection of Dombey, which providentially had been separated. In 1785 another calamity fell upon them, and on us. For the house where they were stopping was destroyed by fire, and with it immense collections which they had made in the vicinity of Lima. In 1788 they embarked from Lima for Spain, taking with them twenty-nine boxes of dried plants, one hundred and twenty-four living plants, and many drawings; and in September of that year they arrived at Cadiz.

The results of this expedition were published in four large volumes with very many plates on steel. To us as Americans, it is interesting to learn that the Spanish colonies in this hemisphere largely defrayed the immense cost of publication by liberal contributions.

The first of these volumes was entitled: "Florae Peruvianae, et Chilensis Prodromus, sive Novarum Generum Plantarum Peruvianarum, et Chilensium Descriptiones, et Icones. Por Don Hipolito Ruiz y Don Joseph Pavon, Botanicos de la Expedicion del Peru, y de la Real Academia Medica de Madrid. De Orden del Rey. Madrid: En la Imprenta de Sancha. M. DCCXCIV."

It contains descriptions of one hundred and fifty genera, one hundred and thirty of which the authors believed to be new; and each is illustrated with beautiful figures. The genera especially interesting to us are of course those of which we have representatives growing in our immediate vicinity, and these seem to be Navarretia, Gilia, Bowlesia, Tessaria, and Soliva.

The main work bears the title: "Flora Peruviana, et Chilensis, Sive Descriptiones, et Icones Plantarum Peruvianarum et Chilensium Secundum Systema Linneanum Digestae cum Characteribus Plurium Generum Evulgatorum Reformatis."

The first volume bears the date 1798; the second, 1799; the third, 1802.

Among the species here described for the first time, which are of especial interest to us, are the following:

Acæna trifida R. & P., vol. 1, p. 67. This plant seems to have been obtained in Chile. It is beautifully figured and minutely described, and the figure and the description agree in all points. Should Chilian specimens agree with the figure and description as given in this volume—and in the absence of evidence to the contrary it is almost fair to assume that this is the fact—it would be impossible for me to call the plant which grows along the shore about here, and which men seem to have called *Acæna trifida* R. & P., by that name, and from the evidence at hand I should be compelled to give it some other designation. For, according to the description, the *Acæna trifida* of R. & P. has globose spikes, "spicis globosis," and "foliola cuneiforma, trifidia, nonnulla quadri-quinquefida." And the figure shows that the word "globosis" is used in the same sense that we understand it. Such a term could of course in no way be applied to any stage of the development of the inflorescence of our plant. And the figure shows us, too, that the word "nonnulla" was aptly chosen. For the leaflets are almost without exception trifid, while in our plant they are equally almost without exception "quadri-quinquefida." But I leave the giving of a name to our species to those who have an opportunity to examine Chilian specimens; for neither in the herbarium of the University of California nor in that of the California Academy are any to be found.

I should like to say a word or two of *Campanula biflora*, R. & P. and *Bowlesia lobata*, R. & P., but fear that I may have taxed already the limit of my space to its utmost.

DR. BRITTON AND MR. BRITTEN AND JACKSONIA.

By Edward L. Greene.

Dr. N. L. Britton and Mr. James Britten, editors respectively of eminently respectable botanic periodicals in New York and in London—representatives respectively of what the one has styled the Neo-American and the other the Paleo-Anglican doctrines of plant naming—these two friends of ours are now and then happy in finding themselves at agreement on a point in nomenclature. The latest occasion of such happiness has come up in connection with Rafinesque's genus Jacksonia; both of them having concluded that I, in my attempt to maintain this name, to the suppression of *Polanisia,* have failed ingloriously.

Now if the case were as simple as Dr. Britton's paragraph makes it; and if the *coup de grace,* as Mr. Britten calls it[2], had been as effectually administered to Jacksonia as he thinks, I believe I should now be ready to abandon researches into plant nomenclature, as governed by priority, as having found myself incapable of handling even an easy subject.

Mr. Britten has reprinted Dr. Britton's words; and I shall do the same:

"*Jacksonia,* Raf. Med. Rep. (II.) v., 352 * * * is published at the place above cited as follows:"

'Jacksonia (trifoliata)=*Cleome dodecandra,* L.' " Now *Cleome dodecandra,* L., Sp. Pl. 672, is a well known Indian species. Rafinesque evidently followed Michaux in supposing that it was North American, and *Cleome dodecandra* Michx. Fl. Bor. Am. ii. 32 (1803) is indubitably the same as *Polanisia graveolens,* Raf. Am. Journ. Sci. i. 379 (1819), and not at all the plant of Linnæus. In matters of nomenclature we must be exact, and so it seems to me that *Jacksonia* Raf. can only apply to the Asiatic Linnæan *Cleome dodecandra.* I do not find any allusion to *Jacksonia* in the subsequent writings of Rafinesque, and presume that he discovered his error."

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[1]Bull. Torr. Club. xx. 277. [2]Journal of Botany, xxxi. 343.

There is no thought expressed in this paragraph which had not presented itself to my mind before I wrote a line upon JACKSONIA. All the grounds of possible controversy which Dr. Britton has thus laid before us had been not only seen, but reasoned upon by me, and the conclusions reached were published by me long since, and still seem the inevitable ones.

My first comment upon what Dr. Britton has given as a quotation from Rafinesque is that it is far from being an impartial statement of what that author actually said about the type of his genus. If the one line, on page 352 of the Repository volume which Dr. Britton cites, had been all, then I grant the necessity of Dr. Britton's conclusion; for there is nothing there to show that Rafinesque had aught save the Linnæan *Cleome dodecandra* before his mind. But the indubitable fact is that he had not that plant in view, but rather an exclusively American species, to which Michaux had wrongly assigned a Linnæan name. It must be that Dr. Britton's omission of passages in Rafinesque's article which I shall quote was accidental. He can not have intended to suppress evidence. Here is the first clause of the title to the article in which JACKSONIA was published:

"Prospectus of Mr. RAFINESQUE SCHMALTZ'S two intended Works on North American Botany: the first on the new Genera and Species of Plants discovered by himself."[1]

This, whoever reads will find to cover all the genera proposed on page 352. And, in the body of the article, page 350 still, he says that his proposed work shall contain "More particularly all new and undescribed genera and species I have found, or which have been communicated to me during my travels through the United States."[2] Hereupon follows a long list of names for new genera, with equivalents given; and after this list another note of explanation that runs thus: "Besides a variety of others I shall re-establish in this work about thirty new genera, from plants already mentioned in authors; but which I have by observation found to disagree sufficiently from the genera where they were placed, to oblige me to separate them for the advantage of the science. These will be:" etc.

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[1] Med. Repos. (II.), v. 350. [2] Ibid, 351.

The seventh in order of these "thirty" is JACKSONIA. So then, so far are we from being left to imagine the man dealing with an Asiatic plant, that we have his express and thrice reiterated assertion that his type is an American plant, which he has observed and decided upon. The thing which he meant as its equivalent in nomenclature was clearly the *Cleome dodecandra* of Michaux; and he did not attempt to prove or disprove the identity of this with the Linnæan *C. dodecandra.* They were very different plants; but whether Rafinesque ever found that out or not, we know not; nor does it concern us. He has, however, left it impossible for one who reads his paper to think that he had any Indian species of *Cleome* in view, as type of JACKSONIA. Mr. Britten in London says that "Prof. Greene shrunk from allowing Rafinesque's *Jacksonia* to claim the Linnæan specific name;"[1] and Mr. Britten may now see that Prof. Greene had every rational historic warrant for declining to apply that specific name to that American plant to which Michaux had erred in applying it. Dr. Britton, however, some years ago did reapply it; and one of the synonyms of JACKSONIA TRIFOLIATA is *Polanisia dodecandra*, B. S. P., of Dr. Britton's making; an error he might have avoided if he had read—as we hope he may soon find time to read—the whole of Rafinesque's paper in the Medical Repository. It is well said by Dr. Britton, as above quoted, that "In matters of nomenclature we must be exact." Exact we ought to be, as far as possible, in all matters appertaining to scientific work. Dr. Britton has long since shown exactitude in dealing with a generic name by Rafinesque, published, indeed, on the same page with JACKSONIA. I refer to *Scoria*. This he rightly rejects, as a name, for the good reason that it does not express exactly what was in the mind of Rafinesque. Now we are all sure—or may become so by reading all of that article in which the name is published—that the author of JACKSONIA had no foreign type in mind; that what he knew, by his own observation, to be a thing distinct from *Cleome*, and called JACKSONIA, was the North American plant; and that it never at any time entered into his thought to give any Indian species of *Cleome* the rank of a new generic type. His only error—a small one, and of a kind which botanists are often betrayed into—was that of writing an L. when he should have written an Michx. after a certain plant name. If this had not been explained by him—if he had not given the botanical world to see that he meant the plant of Michaux and no other—then would Dr. Britton have been correct, and I should not have applied the name JACKSONIA, as I have done, when defending the genus. But, as things stand printed, in the very column which Dr. Britton quotes so insufficiently, it will forever be plain that the Brunonian *Jacksonia* is the one that is dead; and that the Rafinesquian is very far from having received, or being in waiting for, its *coup de grace.*

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[1] Journal of Botany, xxxi. 343.

CALIFORNIAN HERB-LORE.—III.

By IDA M. BLOCHMAN.

IN those primitive times when grocery stores were yet a luxury in Southern California, the Spanish laundress discovered several bleaching agents and substitutes for soap in roots from the hills and canyons. With these and cold water from the family spring she kneeled over her smooth washboard and made her clothes so white that they rivaled the best results now obtained with improved washing machines, and soap which inspires the poet's pen.

The *Cucurbita fœtidissima*, called *Chili Cojote* by the natives, which trails its rough, vile-smelling herbage over large areas of our low river plains, possesses rare medicinal properties in its leaves; these, perhaps, may be mentioned in some future paper, but to-day we concern ourselves only with the large fusiform root.

In the face of all modern improvements in that line, this root is still used by many Spanish laundresses, who declare that it whitens and cleanses as nothing else will. It is reduced to a pulp and then used as ordinary soap. Rinsing must be very thorough, for any particle left in the fabric is exceedingly irritating to the skin; in fact, on this account novices are advised not to use it.

The root of the *Chenopodium Californicum*, which resembles a good-sized parsnip, was also much used for cleansing purposes, and is yet, to some extent. In many parts of Southern California this plant is so abundant that every farmer has bushels of potential cleanliness stored away under his hedge-rows.

When, on summer afternoons, the *Chlorogalum pomeridianum* hangs forth her numberless airy white lilies, no one uninitiated into the mystery of her existence would be so malevolent as to suggest that she draws her sustenance from anything so prosaic as a scrub brush; and yet so it is.

The larger bulb consists of layers of soapy material interspersed with strong woody fibers, the whole forming an ideal utensil of the above named sort. It is still used for laundry purposes and for house cleaning, but proves rather heroic treatment in houses where paint must be taken into consideration. It is popularly known among the Spanish as *Amole.*

OPEN LETTERS.

Another side of the nomenclature question.

I HAVE noticed the criticism of my friend Meehan in the issue of ERYTHEA for last June, page 143, charging him with a lack of appreciation "of the action of those who would have a correct and lawful plant nomenclature;" and I have also read Mr. Meehan's reply in Meehan's Monthly, for last November, page 176, in which he says that he sympathizes with correct nomenclature, but adds that in magazine offices the standard lexicons and cyclopedic words must be followed, and "that the proposed corrections, however justifiable they may be, cannot be used to any practical advantage, until the dictionaries adopt them." I am sure that there is greater truth and meaning in the remarks of Mr. Meehan than most botanists are aware. Mr. Meehan has long been known both as a botanist and horticulturist; he may be said to have stood between botany and the people. I am ready to believe, however presumptuous it may seem—that plants were made quite as much for the horticulturist as for the botanist, and that he has quite as much interest in their nomenclature. But it is apparent that a trade-name must remain practically the same. When a plant becomes known in the trade under a given botanical name, it is well nigh impossible to give it a new one and yet hold the demand or custom for it. Tradesmen and catalogue makers cannot afford the time and expense of attempting to keep pace with the evolution of nomenclature, even though they had the ability or inclination to do so; and if they did, they would find the sales to be less satisfactory. It is true that many or even most of them do not appreciate the necessities of the changes, but the fact nevertheless remains that a name once fixed in the public mind cannot be dislodged with profit. We horticulturists are coming to think, I fear, that the science of names is a greater thing than the science of plants; and it is not impossible that there is some reason for the opinion. These remarks, I hope, will both explain Mr. Meehan's position and emphasize the fact that horticulturists have a just claim upon the botanists.

For myself, I sympapathize with the recent rules of the Botanical Club and shall use them in purely botanical writings; but in horticultural writings I must often use the familiar system, and thereby I may expose myself to the displeasure of some of my botanical friends. In justice to myself, I ought to say that I sympathize with these rules not because I like them—for I do not—but because I hope they will bring peace for a time. I do not believe that we are one whit nearer a stable, or what Professor Greene calls a "correct," nomenclature now than we were ten years ago.

One generation cannot legislate for the next, particularly in matters of the usage of language; and I expect that the time is not very far distant when the old herbalists will have their day and the Linnean standpoint will be upset. But I hope that, so long as we are in the muddle, the new rules may be adopted on all sides as a soporific for the present generation —if haply they wear that long.—L. H. BAILEY, Ithaca, N. Y.

Correct nomenclature, etc.

NOTHING which I have read lately upon the subject of plant nomenclature has pleased me more than the concluding sentences of Professor Bailey's letter, given above. But, that he should deem it needful to suggest to *me* his expectation "that the Linnæan starting point will be upset," is curious enough; for I alone, among American botanists, have, for seven years past, advocated the treating of Linnæus just as we treat other botanists, as regards priority in nomenclature; and I alone, in America, have dropped some Linnæan names in favor of earlier ones, and have, within the last year (ERYTHEA, i. 2), announced a purpose of still further ignoring the Linnæan starting point. Unless my friend at Ithaca reads much current French and Italian botany, or unless he has evolved out of his own perceptions, and originally, an idea of the unsatisfactory character of all starting points, where history has none, he is reiterating in *my* ear the things which he first heard from *me*. Anyhow, I am glad to be able to record, in ERYTHEA, such opinions—such forebodings, if he prefer so to call them—from a man so thoughtful as Professor Bailey is known to be.

Until last year, when Professor Underwood began to express some misgivings as to the Linnæan point of departure for generic nomenclature, I felt alone, and without support. This year, with Professor Bailey apprehending—apprehending somewhat unwillingly and deploringly, but nevertheless *apprehending*—"that the Linnæan starting point is to be upset," I can not but feel somewhat hopeful for the cause of correct nomenclature in America; not the cause of the "Rochester Code," necessarily, nor of any other formulated set of rules more or less complicated and inter-contradictory, but the cause of simple historic priority, exceptions being made only when a purely binomial nomenclature demands the suppression of an intractable generic name or a too long specific one; and these would not be found so very numerous. While I feel the warmest sympathy with, and allegiance to, every regulation voted in any Congress or Club of botanists, that makes for historic truthfulness, and is not at war with binary names, sound reason and good grammar, I still do not share Prof. Bailey's expectations that the rules passed of late in America, may bring peace even for a time. That many of these have been too hastily formulated, and too inconsiderately passed by vote, is evinced by the fact that the very framers of them are soon found to ignore them, upon occasion. Instances of this are already in print relating even to a thing so new as the Madison Code; and one may judge the "soporific" qualities of our codes to be feeble when, so very soon after their enactment, their former most strenuous advocates find them here and there unworthy of respect.

But along the lines of truthfulness and accuracy, the ground is always firm beneath one's feet, and one may labor here with satisfaction, and in confidence as to the future, whether now there be war or peace.—EDWARD L. GREENE, Berkeley, Calif., December 23, 1893.

Publication of varieties.

I NOTE in Contributions from the U. S. National Herbarium, Vol. I, No. 8, page 271, an example (followed, I think, throughout the number,) of an inconvenient way of publishing a new variety.

I read there, "*Poa flexuosa robusta var. nov.*" It seems to me that when a new variety is published the identity of the type should be more definitely given. *Poa flexuosa* may or may not be a definite thing. The binomial may have been used by many men to signify many different plants, and the publisher of a variety should inform us, I think, what species he considers the type of his variety. In the present case perhaps there is no room for doubt, but many cases might be mentioned where the doubt might be serious. And I question whether the above method of publication is sufficient where there has been a homonym of the type.

For citation, "*Poa flexuosa robusta Vasey*" is sufficient; for that is a definite thing, and the addition—the insertion—of another name between "flexuosa" and "robusta" adds nothing to its definiteness. For description, "*Poa flexuosa robusta var. nov.*" is not sufficient, as it does not necessarily contain any hint of the *specific* characters of the plant.—C. MICHENER, San Francisco, Dec. 18, 1893.

TERATOLOGICAL NOTES.

DENDROMECON RIGIDUM, Benth. On May 4 of last year I found on Mt. St. Helena a shrub of the above species in flower, many branchlets and leaves of which were noticeably fasciculate. An inspection showed immediately that the capsules had in many cases been supplanted by a fascicle of leaves which differed in no particular from the normal leaves of the inflorescence. An intermediate stage in which the capsule was evidently formed of two leaves joined together by their edges, but free at their apices, was also noticed. This abortive capsule, it is worth noting, contained ovules and was distinctly stipitate. It was evident that there was a more or less complete reversion of stamens to leaves, and the petals were in all the flowers reduced in size and foliaceous.

ESCHSCHOLTZIA CROCEA, Benth. A remarkable example of fasciation in this plant has been sent to the University Herbarium by R. H. Platt of Vacaville. There was but one stem and this ribbon-like, 1½ inches broad and eight inches long, bearing leaves, and a monstrous flower at its summit. The many styles were crossed over the open mouth of the ovary, which revealed on its sides the numerous ovule-bearing placentæ. The collector stated that fasciation is not uncommon in robust plants of this Eschscholtzia, but that it had never been met with in nearly so marked a degree.

BOISDUVALIA DENSIFLORA, var. IMBRICATA, Greene. Near Little Oak, Solano County, I collected in September, 1893, specimens of the above plant which exhibited a case of fascination in which the flowers and bracts were densely crowded on very short branches (one or two inches long), these for the most part fascicled at the summit of the stem and so disposed as to lie mostly in one plane, thus presenting a flattened-clavate or flabelliform appearance. This abnormal form appears to be hereditary. I have noticed it in this locality for several years, and during the last season such individuals were more numerous than those of the normal form, which, as it grows here, is two to three feet in height, very slender, and with only a few virgate branches at or above the middle of the stem.

WILLIS L. JEPSON.

MISCELLANEOUS NOTES AND NEWS.

DESCRIPTIONS of twelve new species and three new varieties of grasses from California, Oregon and Washington by the late Dr. George Vasey appear in Contributions from the National Herbarium, Vol. 1, No. 8. It is significant that the latest work of several of the best Eastern botanists has been the publication of new, or the confirmation of lately published species from a region in which it was formerly wont to be hinted that of species there were more than enough already published.

THE Gray Memorial Botanical Chapter of the Agassiz Association has ventured on the publication, in a quarterly form, styled the *Asa Gray Bulletin*, of the most worthy of the reports of its members. Three numbers have so far been issued. The Chapter is a corresponding one and remoteness of residence is no bar to membership.

THE Evening Primrose family, it is safe to say, is poorly understood by botanists in general, being mainly indigenous to the more westerly parts of North America; and western botanists who may have studied these plants—none at the East seem to have any interest in them—will be specially interested in LIEFERUNG 96 of Engler & Prantl, lately issued. When it is remembered that no longer ago than 1873, the ruling American authorities held the genera proposed by Spach—even to *Godetia* and *Boisduvalia*—all invalid, and merged the species in *Œnothera*, the monograph that has now just appeared will seem replete with new ideas of the limits of the genera; though the ideas are all old, as are also the names of the multiplied genera; for Spach and Nuttall—perhaps the only men who had studied these plants carefully fifty years since—are the men whose work has met with full approval at the hands of Dr. Raimann. The genera proposed by Spach, in his day, which this new author reinstates are, after *Boisduvalia* and *Godetia*, the following: *Anogra*, *Kneiffia Xylopleurum*, *Pachylophis*, *Lavauxia* and *Megapterium;* all removed from the *Œnothera* of older authors, by Spach as long ago as 1835. The genera proposed by Nuttall about the same time, but which have for some reason been ignored by his successors, and which Dr. Raimann reinstates, are *Taraxia* and *Chylismia*. Adding to these *Salpingia* of Torrey & Gray, and *Meriolix* by Rafinesque we have an aggregate of ten genera which Dr. Raimann follows the older authors in substructing from the *Œnothera* of the DeCandolles. And while the original *Œ. biennis*, L., and its nearest kindred remain, as they should, the typical genus of the order, or suborder, we are pleased to see that the recent author follows Spach in maintaining for it, the name *Onagra* assigned to it by Tournefort.

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EDITED BY

WILLIS LINN JEPSON

AND OTHERS, OF THE DEPARTMENT OF BOTANY,
UNIVERSITY OF CALIFORNIA.

CONTENTS:

PAGE
New West American Fungi, - *J. B. Ellis and B. M. Everhart* 17
Californian Field Notes.—II, - *Anstruther Davidson, M. D.* 27
An Experience in Herbarium Making, - *F. T. Bioletti* 31
Reviews and Criticisms, - - - - 34

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PROF. E. L. GREENE,
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Berkeley, California.

OBSERVATIONS ON THE COMPOSITÆ.—IV.

By Edward L. Greene.

Tribe III: Astereæ.

Between this extensive series of genera and the Eupatoriaceæ the passage is somewhat abrupt, whether we look to the natural qualities or the botanical characters of the two tribes or suborders. Many, or perhaps even most Eupatoriaceous plants are aromatic, bitter, and possessed of recognized tonic and other medicinal qualities. The Astereæ have a bland watery juice, a scentless herbage, and no active properties of any kind, save that in some there is a gummy—or rather balsamic or resinous—exudation on the foliage and inflorescence; but this, if not inactive, is almost odorless.

In botanical characters there seem to be no transitions between the two groups. There are no elongated-clavelliform style-branches in the Astereæ, nor any short and blunt ones in the Eupatoriaceæ; and it is highly probable that to designate the two groups as mere *tribes* of one natural order is a too feeble statement, based on a superficiality of view.[1]

In North America the Astereæ are excessively numerous, and no natural assemblage of plants has seemed to present such difficulties to the systematist; and the widest conceivable diversities of opinion as to the limits of genera have found expression among botanists when undertaking to classify them. Groups of species which one author will combine as of one genus, another will distribute through a dozen genera, if not a score. And characters—such as that of color of flowers—which are of no more than specific value in other orders, and often of less, are here received in some instances as of generic and even subtribal importance; and this not by the hasty and superficial, but by the more careful and cautious of botanists. And many of the most erudite and experienced are observed to advocate views diametrically opposite in respect to the limits of groups, one party maintaining a maximum, the other a minimum of genera; while some, less experienced and less philosophical, but bent upon taking middle ground between these extremes, fall inevitably into very glaring inconsistencies, here presenting unnatural amalgamations of genera, and there, the most empirical and forced segregations. I shall cite a few instances of this diversity of view.

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[1] In the Manual of Bay-Region Botany I have called them Suborders.

Doubtless the most profound and elaborate monograph that has been written upon any part of this group is Nees ab Esenbeck's volume on the Astereæ. It was the result of the observations of half a lifetime on the asters and their nearest allies; and the genus *Aster* of Tournefort, of Linnæus and of Willdenow this author divides into twelve. Of other eminent specialists in this same field, Cassini, the principal one, is almost wholly with him in this view of the limits of the genera. DeCandolle only here and there dissents; Lessing is only a little more conservative; and Nuttall, the most acute and gifted among specialists in American Compositæ is quite with Nees; and not a few of the genera of Nees and of Cassini have been supported by all authorities until Professor Baillon and Dr. Otto Kuntze. But now, a man of Baillon's vast experience and deep research remands to *Aster* all the genera which the illustrious specialists had taken out of it, and many more; while Dr. Kuntze still more recently promulgates his opinion that even *Solidago*, as well all those long series of species named under *Chrysopsis* and *Aplopappus* and *Bigelovia*, in recent books, are but species of the genus *Aster*.

Such extremes of judgment respecting the limits of genera oblige one to enquire into the phytographic principles of those who pronounce them. What, with Nees and Cassini and Nuttall, is the criterion of a genus in this tribe? And what is that criterion with men who take the opposite ground?

The universal axiom accepted by Tournefort, reiterated by Linnæus, and emphasized by many of the leading systematists of this and of preceding centuries is: That the character depends upon the genus, not the genus upon the character.

In fuller terms; that a genus is first recognized, and afterwards defined; and that its acceptability, as a genus, depends more upon the intuitions of the experienced botanist, than upon the characters of flower and fruit which by examination and comparison he may be led to assign it; in a word, that a genus bears some general features—presents some scarcely definable physiognomy—which, as a whole, signifies more to the systematist than does any technical peculiarity.

That this is a leading principle in plant classification no one that I know of has denied; yet there is always a tendency to swerve from this fundamental axiom, in practice, and to act as if the reverse were true; to proceed as if on the principle that there is first a technical character to a genus, and that the presence or absence of this decides everything, without reference to habit, *facies* or any other consideration. It is, indeed, to be suspected that our botanists who so freely reduce the genera of Compositæ ,are working by an inversion of the rule.

No man has more clearly apprehended or more forcibly enunciated this fundamental principle of generic recognition and determination than did Nees ab Esenbeck; and it was the critical study of the allies of *Aster* which led him to realize to the fullest extent, the imperative necessity of adhering to this principle. There was, for instance, no character to be assigned even the genus *Solidago* as distinct from *Aster;* but he could not bring himself to think them one genus, and, leaving *Solidago* in generic rank, he was happy in submitting to the guidance of reason, consistency, and to his own delicate phytologic instincts, and thus separating from *Aster* other equally natural generic groups which had been confused with it in the writings of others.

Professor Baillon does not openly ignore the importance of habit as a key to affinities; but it may almost be said that in practice he does so, for he restores to *Aster* more than thirty genera which others had taken out of it; while Dr. Kuntze—the still more radical and extreme representative of those who invert the natural order of procedure, and ignore the all-important matter of habit—remands even *Solidago* to *Aster* because it has not what he would call a *character*. Every American botanist will protest against this amalgamation of *Aster* and *Solidago* as unnatural, and not to be seriously thought of; but every such protest will be virtually asserting that a genus is a genus whether it have a character or not.

I am far from meaning to say that there is not a proper natural genus *Solidago* which may be known by some character, as well as by a *facies* of its own. But this is not the *Solidago* of De Candolle and of Bentham and of Asa Gray; in other words, not the *Solidago* that Dr. Kuntze attempted to find characters for and could not. And I am quite of the opinion that most of the asteraceous genera when limited according to habit, will be found supported also by some organographic peculiarities. This is equivalent to saying that, in my judgment due value has not of late been accorded to certain characteristics of the corollas, achenes and other organs, either of flower or fruit.

Taking SOLIDAGO then, as a genus at once most natural, and sure of future recognition, its integrity will be greatly fortified by excluding from it, first of all, *Euthamia*, the type species of which are so unlike it in aspect that not even Linnæus at first view thought of them as belonging in *Solidago.* Nuttall in 1818 first indicated the characters of the group and proposed the name, but as subgeneric under *Solidago,* rather than as a genus; not hesitating, however, to express a conviction that the plants are, after all, more nearly allied to *Brachyris* (that is, *Gutierrezia euthamiæ* T. & G. which Pursh had disposed as a new species of *Solidago*), than to *Solidago.* Since *Euthamia* differs from *Solidago* just as *Sericocarpus* from *Aster*, that is, by a different habit and inflorescence and silky-villous turbinate achenes, he who maintains *Sericocarpus* while suppressing *Euthamia* acts unreasonably. The necessity of restoring *Euthamia* to generic rank I saw, while preparing my recently published Manual; and since that has been issued, I have learned with no little satisfaction that Dr. N. L. Britton reached the same conclusion independently, while writing the Compositæ for the new Check List of the Gray's Manual region.

There is another group of species more merged in *Solidago* that should also be excluded, on the ground of habit alone, unless characters for the more satisfactory establishment of a genus (or two) may yet be found. I refer to what Nuttall proposed as a genus *Chrysoma.*[1] These are shrubby or suffrutescent plants, with less of the aspect of *Solidago* than some species of *Euthamia* possess; but they have not the achenes of *Euthamia,* and are therefore probably to be received in the rank of a separate genus. The type of *Chrysoma* is the *Solidago pauciflosculosa* of Michaux. The second species, *C. pumila,* Nutt., has achenes perfectly glabrous, which feature, along with the suffrutescent stem, is against its being referable to *Euthamia*; but from *Solidago* it must needs be excluded, though it should have to stand alone as a generic type.

Among plants that have the *facies* of *Solidago* and which in my judgment, are too empirically separated from this genus by Asa Gray, I would mention the following:

S. Parryi. *Aplopappus Parryi,* Gray, Am. Journ. Sci. 2 Ser. xxxiii. 10 (1862). This plant is surely congeneric with *Solidago,* and near to *S. multiradiata,* though the heads are considerably larger than in any other known species: but in the var. **minor,** (Gray) these are so narrow as to suggest an affinity for *S. macrophylla,* another large-headed boreal or montane species. In its permanently white pappus it is not only at variance with most of those groups of things utterly heterogenous embraced in the *Aplopappus* of Asa Gray, but is in thorough accord with *Solidago;* and the uncommon whiteness of the pappus, as well as the obtuseness of the involucral bracts may be mentioned as suggestive—as far as they go—of a relation with *S. Riddellii* and its allies, themselves forming a rather peculiar group in this genus.

Among herbaceous plants which make a near approach to

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[1] Trans. Am. Phil. Soc. vii. 324.

Solidago in point of habit, BRACHYCHÆTA is conspicuous. Rafinesque, the discoverer of this type, took it for nothing more than a cordate-leaved species of *Solidago.* It has however, a very remarkably short pappus for a Golden Rod, and this is found to consist not of bristles but of narrow paleæ; and among these homochromous aster-allies this kind of character appears to signify more than it does in *Aster* and *Erigeron.* Doubtless, therefore, this genus is to be maintained.

The original specific name of the plant does not appear to me to have been restored, and I here give it place.

B. sphacelata. *Solidago sphacelata*, Raf. Ann. Nat. 14 (1820). *Solidago cordata*, Short. Catal. Kentucky Supplem. (1833). *Brachyris ovatifolia*, DC. Prodr. v. 313 (1836). *Brachychæta cordata*, Torr. & Gray, Fl. ii. 194 (1842.)

There is an extensive group of herbaceous perennials exclusively western and mostly montane so much allied to *Solidago* that if the whole group were introduced into that genus, they would not create within it anything like so strong an element of diversity as several which men are content to admit within the limits of *Aster*, create in that genus. The plants I have in mind are the types of Sir William Hooker's *Pyrrocoma* and Mr. Nuttall's *Homopappus.* I can make of these but one good genus; but the genus is as perfectly natural, as easily recognizable and as readily definable as *Solidago* itself. The plants differ from that genus ostensibly by their few and large heads, in having their involucral bracts more or less conspiciously herbaceous-tipped, and in their pappus, which is brownish or reddish, whereas in *Solidago* this is white. In this red hue of the pappus they are at accord with the South American genus *Hoorebekia,* now generally known under the much later name of *Aplopappus.* But from *Hoorebekia* they differ again in the character of the involucral bracts, and in having few and small rays. But in their mode of growth from a tap root, without the least hint of any spreading by underground shoots, they are distinctly unlike either *Solidago,* or *Hoorebekia,* or any other of those groups included in that medley, the *Aplopappus* of A. Gray. There are a few Solidagos that make some approach to them in coriaceousness of texture, but none that have any such cottony pubescence as seems to prevail extensively in at least the *Homopappus* section of *Pyrrocoma.* The two sections have much the same relation to one another which the ashy-pubescent Golden Rods, *S. nemoralis*, *Californica* and *nana* have to the vivid-green and glabrous species of that genus; though it must be admitted that such extremes of difference in the involucral bracts as appear in *Pyrrocoma*, are not met with in *Solidago.* In enumerating the species, I present them under the two groups.

PYRROCOMA proper (Hook. Fl. i. 306, t. 107. 1833). *Herbage cinereous-pubescent; bracts of involucre foliaceous.*

1. P. CARTHAMOIDES, Hook. l. c. (1833). *Aplopappus carthamoides* Gray, Proc. Philad. Acad. 65 (1863). *Aster carthamoides*, O. Ktze. Rev. Gen. 317 (1891). Heads terminal, large, broadly hemispherical.—Oregon and Washington to Idaho.

2. **P. Cusickii.** *Aplopappus carthamoides*, var. *Cusickii*, Gray, Syn. Fl. 126 (1884). Heads smaller, terminal and subterminal, somewhat turbinate.—Union Co., Oregon.

3. P. RADIATA, Nutt. Trans. Am. Phil. Soc. vii. 333 (1840). *Aplopappus carthamoides*, var. *maximus*, Gray, l. c., in part. Plant quite glabrous; leaves reticulated and with shining surface.—Plains of the Columbia River. An excellent species well characterized by Nuttall, but its characters overlooked by Gray.

Subgenus HOMOPAPPUS (Nutt. Trans. Am. Phil. Soc. vii. 330, as a genus). *Herbage glabrous, or cottony-pubescent or glandular; bracts of involucre, not leafy.*

* *Plants with leaves chiefly radical.*

+—*Bracts of involucre broad and squarrose.*

4. P. PANICULATA, Torr. & Gray, Fl. ii. 244 (1842). *Homopappus paniculatus*, Nutt. Trans. Am. Phil. Soc. vii.

331 (1840). *Aplopappus racemosus,* Gray, partly. Described as having an obconic involucre and achenes hirsute at summit; the heads in clusters at the ends of fastigiate branches.—Plains of the Columbia.

5. P. GLOMERATA, Torr. & Gray, l. c. *Homopappus glomeratus,* Nutt. l. c. *Aplopappus racemosus,* var. *glomerellus,* Gray, partly. Described as with broad subglobose involucre and perfectly glabrous achenes; the heads in interrupted spikes.—Habitat of the preceding.

6. P. ARGUTA, Torr. & Gray, l. c. *Homopappus argutus,* Nutt. l. c. This also made a part of *Aplopappus racemosus,* by Gray; but it has leaves "strongly serrated," whereas in the preceding these are nearly or quite entire. The involucre is obconic; the heads are in axillary and terminal sessile clusters.

7. P. ELATA, Greene, Man. 173 (1894).—A rather rare plant of subsaline ground in western middle California; greatly isolated from its congeners. It does not appear to have been known to the authors of the State Survey Botany.

8. P. RACEMOSA, Torr. & Gray, Fl. ii. 244 (1842). *Homopappus* (*Myrianthus*) *racemosus,* Nutt. l. c. 332 (1840). *Aplopappus racemosus,* Torr., A. Gray. Totally distinct from all the foregoing, by its numerous rays, somewhat silky-pubescent achenes, and usually hoary-cottony pubescence.—Northeastern California and northward.

+- +- *Bracts of involucre more numerous, narrow, not squarrose.*

9. **P. uniflora.** *Donia uniflora,* Hook. Fl. ii. 25, t. 124 (1834). *Homopappus uniflorus,* Nutt. l. c. (1840). *Aplopappus uniflorus,* Torr. & Gray, Fl. ii. 241 (1842),—Plains of the northern Rocky Mountain Region.

10. **P. inuloides.** *Homopappus inuloides,* Nutt. Trans. Am. Phil. Soc. vii. 333 (1840). *Aplopappus inuloides,* Torr. & Gray, Fl. ii. 241 (1842).—Habitat of the last.

CALIFORNIAN FIELD NOTES.—III.

By ANSTRUTHER DAVIDSON, M. D.

On Big Rock Creek.

THE western angle of the Mojave Desert lies mostly within the limits of Los Angeles County, and is bounded on the north and west by the Tehachapi, and on the south by the Sierra Madre and San Bernardino ranges of mountains that extend from the coast hills eastward.

The Southern Pacific railroad crosses the Sierra Madre range through the Soledad Pass and continues across the desert about thirty miles from its western limit. About forty miles further east the Santa Fe railway crosses the range by the Cajon Pass, the mountains between these passes occupying a belt about twenty-five miles wide, and rising from an elevation of about 3,000 ft. at Soledad, to 10,000 ft. near the Cajon Pass. The desert here lies at an average elevation of 2,500 feet, and towards it, from the northern slope of the Sierra Madre range, flow a few mountain streams, the largest of which is Big Rock Creek, about midway between the Soledad and Cajon passes.

Early in the morning of the 4th of July, 1893, my companion and I left the train near the Soledad Pass and taking team from Harold, an adjoining settlement, we turned our faces eastward across the desert. Our road led us through the usual desert shrubbery of *Atriplex* and *Artemisia*, with abundance of *Salazaria Mexicana*, crowded with its bladdery fruit on which the desert chipmunks were making their morning meal; while over all, the gaunt arms of the *Yucca arborescens* waved like spectres in the morning gloom. For twenty miles we travelled before the foothills, and as we turned southward up the Big Rock Creek we left behind the *Larrea Mexicana* and the lower Sonoran belt. For the next five miles the road leads along the creek, until we reached a ranch at an elevation of probably 4,400 feet. Here we made headquarters and began by exploring the creek from where it debouches in the desert to its source in the pine woods on the Sierra slopes.

The spring annuals had here almost disappeared; only occasional remnants of *Gilia* and *Œnothera* were found in bloom among the withered remains of *Glyptopleura setulosa*, *Castilleia plagiotomia*, and other characteristic desert plants. In the shade of the sycamores and willows which here clothed the banks of the stream *Epipactis gigantea* was flowering profusely, and *Glycyrrhiza glutinosa*, a rare plant with us, was locally abundant on a sloping bank. Ascending the valley the willows become less abundant, the stream reappears in volume, and the sandy levels that flank its bank are abundantly clothed with what looks like Juniper, but on investigation proves to be mostly *Kunzia glandulosa*, which seems to occupy a narrow belt at this elevation all the way across the desert rim from Harold to the Cajon Pass. Here for the first time I found *Amygdalus fasciculata*. It grew in dense thickets, and bore little fruit, but was covered with tent caterpillars. Among the desert shrubs *Tetradymia spinosa*, *T. glabrata*, *T. comosa* and *Salvia carnosa* were the most conspicuous. Scattered over the mesa were numerous plants of *Opuntia echinocarpa* with occasionally *O. basilaris*, and a few shrubs of what seemed the typical *Ceanothus vestitus*, Greene. Eriogonums were numerous; *E. Heermanni* and *E. Palmeri* were coming into flower on the higher grounds, while in the river wash *E. molestum* and *E. pusillum* were in full bloom.

In the marshy ground at the river edge magnificent specimens of *Castilleia linariæfolia* abounded, and on the drier ground *Lupinus densiflorus*, *Calochortus Kennedyi* in fruit, *Nicotiana attenuata* and *Juncus longistylis*. A mile or so further up on the exposed slope of the river bank I gathered a dozen specimens of what seemed a variety of *Œnothera gauræflora*, but which on examination and comparison proves to be new. I shall therefore characterize it as

Œnothera rutila. Annual, stoutish, erect, 6 to 8 inches high, glabrous except the younger leaves and the inflorescence which are sparingly pubescent; leaves ovate-lanceolate, narrowed to the petiole, remotely denticulate in the upper half; floral leaves similar but smaller: spike slightly nodding, many-flowered, becoming much elongated: calyx-tube 2 lines long: petals as long ovate, reddish: capsules 8 lines long, obtusely angled, appressed to the stem, attenuate to the narrow apex, curving outwards, puberulent, not contorted; seeds dark and angled.

The plant belongs to the group of which *Œ. alyssoides* and *gauræflora* are the types, but it differs from both in general habit, color of stem and flowers, and shape of capsules.

In the journey up the stream we found *Capnorchis chrysantha*, *Fremontodendron Californicum* in fruit, *Erythræa Douglasii*, *Aquilegia truncata*, *Mimulus Parishii*, *Lotus oblongifolius*, *Eriogonum nudum* and *E. pauciflorum*, and *Forestiera Neo-Mexicana* in abundance, the last in two instances acting as the host of that omnivorous parasite, *Phoradendron villosum* var. *macrophyllum*.

On the following day we drove up an excellent road for eight miles towards the summit of the mountain range, and found a wealth of species hitherto unrecorded for this county. As we entered the pine belt I was somewhat surprised to find that the trees of the lower range were mostly *P. monophylla*, which I had not expected to find so far south. Later in the season I was credibly informed a few of these pines are found on Mt. Lowe and other peaks above Pasadena, nearly fifty miles south of its original station. We passed numerous handsome specimens of *Malveopsis Fremonti* growing among the wayside shrubs, and some withered plants of *Gomphocarpus tomentosus*, and *Asclepias vestita* var. *Mohavensis*. Passing an alkaline swamp we added *Iva axillaris* and *Sisymbrium incisum* var. *filipes* to our collection; then passed on through a few miles of uninteresting country till *Gayophytum diffusum* began to appear; and after that there followed in rapid succession those species mostly peculiar to the higher altitudes of our southern mountains; *Arenaria macradenia*, *Lotus sericeus* and *crassifolius*, *Scutellaria angustifolia*, *Monardella linoides*, *Caulanthus procerus*, *Frasera nitida*, *Galium multiflorum*, *Euphorbia Palmeri*, *Silene platyota*, and *S. Palmeri* were all common.

Towards the summit three cienegas were explored, two of which comprised a few acres of arable land, and afforded a seemingly precarious livelihood to a few lonely pioneers. At the lower cienega *Fremontodendron* was gorgeous in its golden bloom, *Potentilla Nuttallii* was beautiful in abundance, with here and there *P. glandulosa* var. *Nevadensis* and *P. Parryi* just passing out of flower. *Selinum capitellatum* was flowering in the marshes. In the cultivated grounds at the higher cienga *Gilia tenuiflora*, *Phacelia Lemmoni*, *P. bicolor*, *P. Mohavensis* and *P. Davidsonii* grew in more or less profusion; and in the wet lands above the *Potentilla* reappeared. On the mountain slopes beneath the pines I gathered *Velæa Parishii*, *Calochortus Palmeri*, *Cerasus demissa*, *Pedicularis semibarbata*, *Astragalus Purshii*, *Tetradymia canescens*, and *Senecio ionophyllus*, the latter previously reported only by Prof. Greene from Kern County. Some miners here informed us of the presence of a pitcher plant higher up but the deepening twilight forced us to retrace our steps without being able to verify their report.

To Prof. Greene of Berkeley, Mr. Fernald of Cambridge, and Mr. Parish of San Bernardino, my thanks are gratefully tendered for their assistance in identification of some of the species mentioned in this paper.

HISTORICAL NOTES ON SOME CALIFORNIAN TREES.—II.

By Edward L. Greene.

More than a half-century after Vancouver's writing, some explorers of our own nationality, entering California from the eastward, were deeply impressed with the magnificence of *Q. lobata*, and made some record of their observations.

Fremont, in 1846, traversing the level country east of the San Joaquin, describes the fertile river bottoms as "covered with green grass, among large oaks." And further on he says: "the tree attains frequently a diameter of six feet, and a height of eighty feet." Ten years after Fremont, Professor

Newberry, of one of the Pacific Railway exploring expeditions, writes of a similar district as follows: "This timber belt is composed of the most magnificent oak I have ever seen." Comparing the groves of them with eastern oak forests he says: "They are not crowded as in our forests, but grow scattered about singly, or in groups, with open grass covered glades between them. The trunks, often seven feet in diameter, soon divide into branches which spread over an area of which the diameter is greater than the height of the tree."

The largest Californian oak tree of which any kind of record has been made, was doubtless of this species, and gave the name of Big Oak Flat to a mining camp in Tuolumne County at an early day. The trunk of this is said to have been eleven feet in diameter; but this giant was destroyed by the miners, to make firewood.

Inasmuch as the wood of white oak in general is of world-wide celebrity for its hardness and durability, it is much to be desired that some of our botanists should take in hand some researches into the merits of our Californian species from an economic standpoint. According to Vancouver a hundred years ago, the timber of *Q. lobata*, to repeat his words, "is reputed to be equal in quality to any produced in Europe." One must doubt if, as early as 1792, this oak had fairly earned such reputation. It does not seem likely that any fair tests had so early been given it. And, whether to this day, any such article as Californian white oak lumber, is made use of by the manufacturers of wagons, machinery, or household furniture, I doubt. I am under an impression that all such woods in use here are imported from the Atlantic side of the Continent; but there is room at this point, as I have just hinted, for an investigation to be made by some zealous student of our trees.

Later writers have attributed to even this fairest of our native oaks, a poor quality of wood; but upon what kind of tests—if any have been made—I know not.

But, as subserving one need of the aboriginal inhabitants of California, this species of oak was perhaps the most important tree in the entire silva of the region, through unnumbered generations of their never-to-be-written history. Its fructification supplied them with bread. Its acorns are the largest borne by any oak known to botanists; are produced in prodigal abundance; and, while the kernel in its crude state has some astringent and otherwise unpalatable and perhaps unwholesome qualities, the Indians, by a few simple arts, managed to dispel these contituents, so transforming these large acorns into something perhaps scarcely less agreeable or wholesome than chestnuts. The close relation between the white oaks and the chestnut trees is known to all botanists; and some Mexican species of oak yield acorns so much like chestnuts in the absence of all unpleasantness of flavor that, like them, they find their place, and a ready sale in village market-places. It is then easy to believe that the food which the oak-groves yielded to the savage populace may have been not only nutritious but palatable; and that it should have continued in use, as it has said to have done, long after the early days of wheat-growing in California; and that even some late remnants of the aboriginal tribes should have been known to prefer the aboriginal acorn-cake to the loaf made from the best wheat flour.

Thus far I have spoken of only two out of eighteen or twenty Californian species of oak. But these two are they which have had the most extended period of botanical history. They both became known to botanists more than a hundred years since. They were first on the list of dendrological discovery because they were large trees growing near the seaboard; and a mighty interval of years elapsed before another one of our eighteen or twenty oak-species was entered on the list.

The work which the Spanish botanists began along this line was not resumed until forty years afterwards, when David Douglas landed on the same shore, rediscovered *Q. agrifolia* and *lobata*, and, proceeding further inland, added *Q. densiflora* and *Douglasii* to the list; and then, on the banks of the Columbia, far beyond our borders acquired the one which he named *Q. Garryana*, now recognized as also a Californian oak.

Thus it appears that Hænke's discoveries were grown old, and had been almost forgotten when those of Douglas began; and as late as 1844, Bentham republished *Q. lobata*, supposing it to be an unpublished oak, and assigned it the name *Q. Hindsii* in compliment to an English botanist. Four years after this, Dr. Torrey of Columbia College, then foremost among American botanists, duplicated Bentham's error, publishing the same tree as new, and under the name *Q. longiglandis*. His specimens, and some verbal information about the tree, had been furnished by Fremont.

OPEN LETTERS.

Professor Greene and Jacksonia and Polanisia.

Notwithstanding the forceful appeal for the recognition of *Jacksonia* of Rafinesque as a genus, recently made in the columns of this entirely reputable journal,[1] I must still maintain my position that unless *Cleome dodecandra*, L., on which the name is founded, can be generically grouped with the North American plants under discussion, the name must remain in the category of synonyms. Michaux,[2] who was apparently the first botanist to allude to our species, erroneously identified it with the Indian *Cleome dodecandra* of Linnæus. Rafinesque, five years later,[3] based *Jacksonia,* not on anything Michaux had written, so far as the context shows, but distinctly and definitely upon the Indian plant.

Now proof of the assumption that Rafinesque meant exactly what he wrote is to be found in a paper by him, entitled "Descriptions of Three New Genera of Plants from the State of New York,"[4] published in 1819, where he proposes *Polanisia* as a genus, without alluding to his earlier *Jacksonia*, evidently not as I surmised on account of discovering his error, but apparently in forgetfulness of his publication of *Jacksonia*. At the place cited he gives an extended diagnosis of *Polanisia* and remarks "The type of this genus is the *Cleome dodecandra* of Linnæus, under which denomination many species were blended." Following this comes a characterization of *Polanisia graveolens*, which he remarks "is the *Cleome dodecandra* of Michaux and Pursh."

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[1] Erythea, ii, 6-9.

[2] Fl. Bor. Am. ii, 32 (1803).

[3] Med. Rep. (II) v, 352 (1808).

Am. Journ. Sci. I, 337-339 (1819).

Polanisia can then be maintained for the North American genus by the exclusion of the species named as the type, but *Jacksonia* not at all, for it is based on a true *Cleome*.

N. L. Britton,
Columbia College, New York.

Jacksonia, but not Polanisia.

My first comment on what Dr. Britton has presented above is, that Rafinesque in 1808 either published the genus, or he did not. The fuller expression made in 1819 may or may not all have been in his mind in 1808; and we must take, or we must reject as insufficiently published, the *Jacksonia* by its own date. It is not, as in the case of *Hicoria*, a question of misprint; it is a question of what plant is the type of Jacksonia. Rafinesque's thrice repeated assertion that his type of *Jacksonia* is a plant of the United States that he has seen and examined, Dr. Britton does not appear yet to have read. Or, if he has read it, how can he contradict it all by saying, that the genus was founded "distinctly and definitely upon the Indian plant?"

That *Polanisia* has the Indian plant for its type is clear enough; but this is of 1819, and does not closely touch, or even at all affect the question of *Jacksonia*. But since this type species of *Polanisia* is a true *Cleome*, how can *Polanisia* in any case be retained for the American plants? I did not know that Dr. Britton had receded to the old practice of retaining a generic name in use, after its type has been remanded.—Edw. L. Greene.

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ERYTHEA

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EDITED BY

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AND OTHERS, OF THE DEPARTMENT OF BOTANY,
UNIVERSITY OF CALIFORNIA.

CONTENTS:

PAGE
Observations on the Compositæ—V., - - *Edw. L. Greene* 69
Additions to the Flora of Los Angeles County, *A. J. McClatchie* 76
American Species of Wulfenia, - - - *Edw. L. Greene* 80
Californian Field Notes—IV., - - - *Dr. A. Davidson* 83
An Editorial on Some Editorials, - - - 85

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PRINCIPAL BOTANICAL WRITINGS OF PROFESSOR GREENE.

NEW SPECIES OF PLANTS FROM NEW MEXICO. Four papers in *Botanical Gazette*, Vol. vi., 1881.

NEW PLANTS of CALIFORNIA, ARIZONA AND MEXICO. Nine papers in *Bulletin of the Torrey Botanical Club*, Vols. ix. and x., 1882-83.

STUDIES IN THE BOTANY OF CALIFORNIA AND PARTS ADJACENT. Six papers in *Bulletin of the California Academy of Sciences*, Vols. i. and ii., 1885-87.

BIBLIOGRAPHICAL NOTES ON WELL KNOWN PLANTS. Ten papers in *Bulletin of the Torrey Botanical Club*, Vols. xiv.—xvii., 1887—90.

PITTONIA. A series of Eighty-Seven Papers, in Two Volumes, pp. 617, 1887-92. Published by the author. Price $2.50 per volume.

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FLORA FRANCISCANA. An attempt to classify and describe the Vascular Plants of Middle California. Parts i., ii. and iii. (pp. 352, 1891-92) finished. Price $2.00.

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OBSERVATIONS ON THE COMPOSITÆ.—V.

By Edward L. Greene.

[Pyrrocoma concluded, from p. 60.].

11. **P. crocea.** *Aplopappus croceus,* Gray, Proc. Philad. Acad. 65 (1863). *Aster croceus,* O. Ktze. Rev. Gen. 317.—Middle Park, Colorado, and elsewhere in moist meadows at great elevations.

12. **P. integrifolia.** *Aplopappus integrifolius*, Porter, in Gray, l. c. (1863). *Aster Canbyi,* O. Ktze. l. c. 315.—In similarly high and cold mountain meadows of Wyoming and Montana.

13. **P. lanceolata.** *Donia lanceolata*, Hook. Fl. ii. 25 (1834). *Homopappus multiflorus*, Nutt. Trans. Am. Phil. Soc. vii. 333 (1840). *Aplopappus lanceolatus,* Torr. & Gray, Fl. ii. 241 (1842). *Aster lanceolatus*, O. Ktze. l. c. 313.—Common in moist plains throughout the Great Basin and northward.

14. **P. tenuicaulis.** *Aplopappus tenuicaulis*, D. C. Eaton, Bot. King Exp. 160: *A. lanceolatus* var. *tenuicaulis,* Gray, Syn. Fl. 129.—Plentiful at the Humboldt Wells, Nevada, and thoroughly distinct from *P. lanceolata.* The two grow in the same localities, without intergrading.

15. **P. hirta.** *Aplopappus hirtus,* Gray, Syn. Fl. 127 (1884). *Aster Grayanus,* O. Ktze. l. c. 316 (1891). Plant with just the habit of *P. lanceolata,* with leaves quite as exclusively radical, and stems scapiform; hence Asa Gray's remark that it has the habit of "*Aplopappus Whitneyi* " is entirely unaccountable, for that is not only wholly destitute of radical leaves, but has erect stems suffrutescent at base, and equably leafy up to the inflorescence. The involucres of the two species, and these only, are much alike. In habit there is not the least likeness between them.—Oregon and Washington.

16. **P. apargioides.** *Aplopappus apargioides*, Gray, Proc. Am. Acad. vii. 354 (1868). *Aster apargioides*, O. Ktze. l. c. 317 (1891).—Of the eastern Sierra Nevada and parts adjacent.

17. **P. Howellii.** *Aplopappus Howellii*, Gray, Syn. Fl. Supplem. 446 (1886). This the author compares with *P. uniflora*, though without expressing any opinion that the two are closely allied. They are not at all alike in habit; for *P. uniflora* has a tap root and no caudex, *P. Howellii* has a branching caudex much like that of many western cespitose species of *Erigeron;* on which account its admission into *Pyrrocoma* somewhat modifies the generic character in a way that is not very satisfactory.

* * *Stems equably leafy to the summit.*

18. P. FOLIOSA, Gray, Journ. Bost. Soc. Nat. Hist. 5 (1843). *Aplopappus Fremonti*, Gray, Proc. Philad. Acad. 65 (1863). *Aster Wardii*, O. Ktze. l. c.—Nearly local along the upper Arkansas River, in Colorado. Perhaps not of this genus; the stems clustered; radical leaves none.

In South American asteraceous plants an intensely reddish or brownish pappus is very prevalent; but the Chilian species, referred to *Pyrrocoma* by Philippi and others, are certainly not of this genus. They are mostly shrubs, and they make a near approach, to say the least, to our genus *Hazardia*.

In his very important contribution to the knowledge of West American Compositæ, which we must here cite so often, Nuttall placed his proposed new genus STENOTUS next after *Homopappus;* but these two groups of plants are widely separated from each other in mode of growth. The typical Stenotus species are all woody-cespitose plants, with foliage coriaceous and evergreen. They are really evergreen undershrubs, rather than herbaceous plants. In this one respect they come nearer to the true *Hoorebekia* (*Aplopappus*) of South America than do any other North American plants. But they have an involucre of quite another character, as well as a different pappus and different achenes. Their rays also are few and short, and the foliage is entire.

Asa Gray, in doing the Compositæ for the Torrey & Gray Flora, found *Stenotus* an acceptable genus, and also added to it a number of other more or less analogous types, some of which, as he afterwards discovered, were wholly foreign to it: *Erigeron ? florifer*, Hook., for one example; and this was found to be a genuine *Townsendia*. And the *Stenotus pygmæus*, published as new in the volume referred to, is of no near affinity to true *Stenotus*, although the author placed it in between those typical species, *S. acaulis* and *armerioides*. It is an herbaceous perennial, not a coriaceous-leaved undershrub, and has not the involucre nor the achene of true *Stenotus*. It is more naturally congeneric with *Chrysopsis* or *Macronema*, but may also be viewed as a somewhat near relative of *Solidago Parryi*.

In joining to *Stenotus* the *Aplopappus linearifolius* of DeCandolle some violence was done to Nuttall's conception of the genus; for, while the achenes are densely white-villous, and the pappus also is of a clear and permanent white, the type is a shrub of bushy and compact habit, and the leaves are only subcoriaceous, besides being punctate and resinous-viscid. These considerations, and also the fine soft texture of the pappus, suggested to Dr. Gray a relation to *Ericameria*. But the densely villous achenes, no less than the very different involucral bracts, would render them more anomalous in *Ericameria* than they are in *Stenotus*, in which last I place them, preferring this course rather than the alternative of treating them as a distinct generic type; but after all, they do render STENOTUS unsatisfactorily diversified.

1. S. ACAULIS, Nutt. Trans. Am. Phil. Soc. vii, 334 (1840). *Chrysopsis acaulis*, Nutt. Journ. Philad. Acad. vii, 33 (1834). *Aplopappus acaulis*, Gray, Proc. Am. Acad. vii, 353 (1868). —On bleak open stony hills and mountain summits, from Wyoming to eastern California.

2. S. CESPITOSUS, Nutt. l. c. (1840). *Chrysopsis cespitosa*, Nutt. l. c. (1834). *Aplopappus acaulis*, var. *glabratus*, D. C. Eaton, in Bot. King Exp. 161 (1871). *Aster cespitosus*, O. Ktze. Rev. Gen. 315 (1891).—Wyoming to eastern Nevada.

3. S. ARMERIOIDES, Nutt. l. c. (1840). *Aplopappus armerioides*, Gray, Syn. Fl. 132 (1884). *Aster armerioides*, O. Ktze. l. c. 317 (1891).—Wyoming to New Mexico.

4. **S. stenophyllus.** *Aplopappus stenophyllus*, Gray, Bot. Wilkes Exp. 347 (1874). *Aster stenophyllus*, O. Ktze. l. c. 318 (1891).—Idaho and Washington to northeastern California.

5. **S. lanuginosus.** *Aplopappus lanuginosus*, Gray, l. c. (1874). *Aster Pickeringii*, O. Ktze. l. c. 316 (1891).—Washington to Montana.

In publishing these last two species Dr. Gray remarked upon their lack of conformity to the typical *Stenotus* and suggests a connection with "*Arnicella*," i. e. the *Homopappus* section of *Pyrrocoma*. But their habit and the soft copious white pappus exclude them from that group. They are really much nearer the alpine acaulescent species of *Aster;* and since we have undoubted Erigerons with yellow flowers, so these might easily be received as correspondingly yellow-flowered Asters, had they but the less copious firmer and dingy pappus-bristles of *Aster;* but in view of these facts we cannot but refer them to *Stenotus* rather than to any other genus.

6. S. LINEARIFOLIUS, Torr. & Gray, Fl. ii, 238 (1842). *Aplopappus linearifolius*, DC. Prodr. v, 347 (1836).—Dry slopes of the inner Coast Range of western middle California.

7. **S. interior.** *Aplopappus interior*, Coville, Proc. Biol. Soc. vii, 65 (1892).—Desert hills of eastern California and adjacent Arizona. A very good species, happily segregated from the preceding by Mr. Coville.

Another small genus of undershrubs which, in my opinion, should not have been suppressed, is Nuttall's MACRONEMA. These are not evergreen. Their foliage is thinnish and entire. The involucre is double; a character which almost reappears in some species of *Chrysopsis* where there are foliaceous bracts subtending the real involucre. The achenes in *Macronema* are elongated and compressed, and either somewhat hairy or glabrous. The genus took its name from the conspicuously slender and elongated style-tips. I recognize the following species.

* *Heads few or solitary, rather large.*

+– *Ray-flowers present.*

1. **M.** SUFFRUTICOSUM, Nutt., Trans. Am. Phil. Soc. vii, 322 (1840). *Aplopappus suffruticosus*, Gray, Proc. Am. Acad. vi, 542 (1865). *Aster suffruticosus*, O. Ktze, Rev. Gen. 315 (1891).—High elevations of the northern and middle Sierra Nevada; also in Oregon, Washington and Nevada.

2. **M. molle.** *Aplopappus mollis*, Gray, Proc. Am. Acad. xvi, 80 (1880).—High mountains of eastern Oregon and Washington; the geographic center of distribution for this genus.

3. **M. Greenei.** *Aplopappus Greenei*, Gray, l. c. (1880). *Aster Greenei*, O. Ktze. l. c. 318.—Habitat of the last, but ranging much farther southward, reaching the middle of California in the higher Sierra.

4. **M. pygmæum.** *Stenotus pygmæus*, Torr. & Gray, Fl. ii, 237 (1842). *Aplopappus pygmæus*, Gray, Am. Journ. Sci. 2 Ser. xxxiii, 239 (1862). *Aster Stenotus*, O. Ktze. l. c. 317. Erroneously associated with the *Stenoti* at the first by Dr. Gray, he continued so to regard this to the last. But it has none of the special features of that group. It is, however, somewhat nearer to *Solidago Parryi*, though destitute of the underground shoots by which that species, like other Golden Rods, spreads. But it is less herbaceous than any of that genus. The persistent parts of the stem, though almost

subterranean, are woody, and this feature, along with the foliaceous outer bracts of the involucre, and the long style-tips, confirm it as a *Macronema*.—Rocky Mountains of Colo.

+ + *Ray-flowers wanting.*

5. **M.** DISCOIDEUM, Nutt. Trans. Am. Phil. Soc. vii, 322 (1840). *Aplopappus Macronema*, Gray, Proc. Am. Acad. vi, 542 (1865). *Aster macronema*, O. Ktze. l. c. 318.—Of more extended range than any other species, reaching Wyoming and Colorado, and the mountains of eastern California to the middle of the State.

* * *Heads many, few-flowered, fastigiate-clustered.*

6. **M. Watsonii.** *Aplopappus Watsonii*, Gray, Proc. Am. Acad. xvi, 79 (1880). *Aster Serenoi*, O. Ktze. l. c. 316. This plant is so good a *Macronema* in *facies*, as well as character, that Prof. Eaton mistook it for a mere form of the typical species of the genus (Bot. King. Exp. 159) with heads in a " terminal corymb."—Apparently restricted to the mountains of Nevada and Utah.

There is another genus of plants to which I consider *Macronema* to be more closely allied than to *Stenotus*, and that is CHRYSOPSIS; and if *Macronema* be not retained as a genus, it is into this, and not *Hoorebekia* (*Aplopappus*) that the species should go. The involucres in *Chrysopsis* are of narrower, less foliaceous and far more numerous bracts than in *Macronema;* the plants are all herbaceous and have an ampler and otherwise different inflorescence; moreover, in the typical species the pappus is double; though if this last character is to be made much of in this tribe it will divide and subdivide both *Aster* and *Erigeron*.

The typical species of *Chrysopsis* had been referred by Linnæus to the Old World genus *Inula;* and Rafinesque was the first to remark in the American plants a noteworthy divergence from the proper type of that genus. In 1818 he therefore indicated them as forming a genus, essaying to give as a name *Diplogon*, which was not available, having been employed by Poiret in 1811 for a genus of grasses. In the same year in which Rafinesque proposed his *Diplogon*, Nuttall indicated the same plants as forming a subgenus of *Inula*, assigning as a subgeneric name *Chrysopsis;* and this, in 1824, was taken up by Elliott as the name of that genus of which *Inula Mariana*, Linn., is the earliest type.

Confirmed by DeCandolle in the Prodromus in 1838, *Chrysopsis* was at last accepted as a genus by Nuttall himself in 1840; and it has since then pretty well maintained its place in the list of defensible asteroid genera. And, while it may be safe to say that these plants are less foreign to *Aster*, than are some genera which Dr. Kuntze has sought to merge in that genus, he nevertheless maintains *Chrysopsis*, though under the unavailable name of *Diplogon;* so much stress does he lay upon the circumstance of a small somewhat paleaceous outer pappus. Bentham, and also Gray, seem to have accepted this as the real generic character; but Lessing, in 1830, on account just this character, had referred *Chrysopsis* to *Diplopappus*. On the whole, both the status of the genus and the stability of the name *Chrysopsis*, are seemingly somewhat precarious. For example—receding to the year 1813, we find that upon a certain West American type now everywhere received as congeneric with *Inula Mariana*, Linn., Nuttall attempted to found a genus *Sideranthus;* and while some will regard this as *nomen nudum*, others may, with some show of reason, incline to accept *Sideranthus* as a published genus dating from Fraser's Catalogue. Thus *Sideranthus* might supplant *Chrysopsis*. Again: M. Baillon considers these types all congeneric with the South American *Hysterionica* published by Willdenow as early as 1807. I have not yet had the satisfaction of seeing specimens of the typical species of this genus; but Mr. Bentham maintains the group as generically distinct from *Chrysopsis* by a somewhat different habit, less copious pappus, broader style-appendages, and its South Brazilian habitat. And even M. Baillon, who suppresses it, admits that the ray-corollas are much more numerous and narrower than in *Chrysopsis*—a character quite like that which, in the main, distinguishes such thoroughly acceptable genera as *Aster* and *Erigeron*. So that, upon the whole, we, who have to deal with the North American allies of *Hysterionica*, seem at present fully warranted in maintaining *Chrysopsis*, though under just what limitations may not be so clear; for, if we receive the genus upon its character of a double pappus, as Asa Gray did, then we must exclude *Ammodia*, or else be as inconsistent as that author was. But, in view of the general impracticability of resting asteroid genera on matters of a simple or double pappus, I here ignore the character and admit the species of *Ammodia* into *Chrysopsis*, on the ground of their general likeness to the species of that genus. However, I cannot but remark that so great is the difference in *facies* between the type of *Ammodia* and *Chrysopsis Breweri*, that I feel less hesitancy about allowing them both to figure as species of the ample genus *Chrysopsis*, than I should in attempting to force them into a genus *Ammodia* of two or three species, where the contrast between *Breweri* and the others would seem to stand out more glaringly. Really, the foliage and the inflorescence of *C. Breweri* are not those of any *Chrysopsis* or *Ammodia;* and perhaps the most satisfactory course to pursue would be to adopt *Ammodia* with its two species (*A. Oregana,* Nutt., and *Chrysopsis rudis,* Greene, Man.), and receive *C. Breweri* in the rank of a genus.

ADDITIONS TO THE FLORA OF LOS ANGELES COUNTY AND CATALINA ISLAND.—I.

By ALFRED JAMES MCCLATCHIE.

LOS ANGELES COUNTY, like so many other counties of California, has a very much diversified surface, and consequently a varied flora. From the sea coast on the southwest it extends over the San Gabriel Mountains into the Mojave Desert on the northeast. Notwithstanding the extensive collecting that has been done in the county by W. S. Lyon, S. B. Parish, Rev. J. C. Nevin, Dr. A. Davidson and others, there is much yet to be done before even the higher plants of the county can be said to be fairly well known.

During the past two years, aided by my wife, Anna Morrison McClatchie, some parts of the county, especially the region about Pasadena, have been quite carefully explored. This has resulted in the addition of about sixty species to the mainland list. Last September we spent ten days upon Catalina Island, where we collected about twenty-five plants not previously reported from the island. Five of these have since been reported by Dr. Davidson,[1] whose visit there antedated ours a few weeks. I am indebted to Professor E. L. Greene, Mr. S. B. Parish, Professor F. Lamson-Scribner and Mr. W. L. Jepson for kind assistance in identifying many of the plants.

In the following list are included those Pteridophyta and Spermaphyta not credited to the localities given below by the authors of the local floras.[2]

Cystopteris fragilis, Bernh., *Asplenium Trichomanes* var. *incisum*, Moore, *Adiantum pedatum*, L., *Notholaena Newberryi*, Eaton. In a few localities in the San Gabriel Mts.

Adiantum Capillus veneris, L. Cañons of Catalina Island.

Pinus monophylla, Torr. Frem. Summit of Mt. Lowe, 6,000 ft.

Andropogon macrourus, Michx. Cañons of San Gabriel Mountains.

Polypogon littoralis, Smith. Pasadena.

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[1] New Records for Catalina Island, Erythea II, 30.

[2] Plants of Southern California, S. B. and W. F. Parish, 1883.
Supplementary list of plants of southern Calif., same authors, 1884.
List of Catalina Plants, W. S. Lyon. Bot. Gaz., Aug. 1886.
The Plants of Santa Catalina Island. T. S. Brandegee, Zoe I, 107.
List of Plants of Los Angeles County. A. Davidson, 1892.
Additions to the Flora of Southern California. S. B. Parish, Zoe IV, 160.

Aristida divaricata, HBK. Altadena.

Muhlenbergia Mexicana, Trin. Cañons of San Gabriel Mountains, Arroyo Seco.

Agrostis attenuata, Vasey, *A. microphylla*, Steud. Foothills San Gabriel Mountains.

Avena barbata, Roth. Streets of Pasadena, Los Angeles and Avalon, Catalina Island.

Trisetum barbatum, Steud. Arroyo Seco.

Holcus lanatus, L. Oak Knoll, Santa Anita.

Eragrostis Mexicana, Link. Streets of Pasadena, Los Angeles river bottom.

Bromus maximus, Desf., *Hordeum pusillum*, Nutt. Avalon, Catalina Island.

Elymus triticoides, Nutt. Foothills of San Gabriel Mountains; Avalon, Catalina Island.

Elymus Sibiricus, L. Foothills of San Gabriel Mountains.

Cyperus erythrorhizos, Muhl. Los Angeles river bottom, Oak Knoll, Baldwin's ranch.

Scirpus sylvaticus, var. *digynus*, Boeck. Common about Pasadena.

Carex teretiuscula, var. *major*, Koch. Cañons of San Gabriel Mountains.

Lemna gibba, L. Pond near Pasadena.

Juncus dubius, Engelm. Oak Knoll.

Rumex conglomeratus, Murr. Pasadena.

Rumex crispus, L. Avalon, Catalina Island.

Polygonum Convolvulus, L. Pasadena.

Eriogonum saxatile, Wats. Mt. Lowe.

Atriplex microcarpa, Dietr. Avalon, Catalina Island.

Atriplex Californica, Moq. Catalina Island.

Amarantus albus, L. Avalon, Catalina Island.

Silene Palmeri, Wats. Mt. Lowe.

Alsine nitens, Greene. Cañons of Catalina Island.

Lœflingia squarrosa, Nutt. Near Redondo.

Papapaver Californicum, Gray. Hills near Pasadena.

Cotyledon Nevadensis, Wats. Foothills of San Gabriel Mountains.

Saxifraga Californica, Greene. Arroyo Seco.

Ribes divaricatum, Dougl. Oak Knoll. .

Ribes hesperium, n. sp. Shrub 5—10 feet high with spreading branches; stems smooth, beset with dark colored spines which are commonly single, but occasionally double or triple; leaves, inflorescence and young branches puberulent; leaves thin, ½—1¾ in. broad, 3—5-lobed, the lobes incised; peduncles 1—2-flowered, 2—3 lines long; pedicels about 3 lines long; bracts broad, fan-shaped with ciliated membranous pinkish margin; flowers about ⅜ in. long; calyx-tube campanulate, slightly inflated, about 1 line long; segments from greenish-white to greenish-red, 3—4 lines long; petals white tinged with red, about half the length of the sepals, cuneate-oblong, 2- or 3-toothed, slightly involute; filaments about half longer than petals; anthers ovate-oblong, mucronate, greenish; ovary densely echinate, bristles greenish-red, mature berry very prickly, ½—¾ in. in diameter.—Common in shaded cañons of San Gabriel Mountains, flowering in January and February; fruit ripe in June and July. Collected at various times during 1893 and winter of '94. Fruit edible and of agreeable flavor.

Ribes amarum, n. sp. Shrub 3—8 ft. high, rigid stems and branches beset with yellowish-brown (commonly triple) spines, often setose-hispid; leaves, inflorescence and young branches glandular, pubescent and bitterish fragrant; leaves thin, ½—1½ in. broad, 3—5-lobed and incised; peduncles 1- or 2-flowered, 3—5 lines long; pedicels each with a round-ovate

2—4- (usually 3-) lobed bract, about 3 lines long; flowers ¾ in. long; calyx-tube oblong-campanulate, 3 lines long, segments purplish-red, reflexed, 4 lines long, tips greenish, especially on back; petals pinkish-white, red-streaked near base on inside, 2 lines long, strongly involute, suborbicular when flattened out, rounded and erose-toothed at summit; pinkish filaments equalling or slightly exceeding the petals; anthers sagittate, ovate-oblong, mucronate, purplish; ovary densely glandular hairy; mature berry ½—¾ in. in diameter, densely covered with glandular bristles which produce a very bitter secretion; pulp sweet. — Quite common in shaded cañons of San Gabriel Mountains. Collected at various dates during 1893 and winter of '94; flowering in February and March; fruiting from May to August.

Ribes nubigenum, n. sp. Shrub 1—2 ft. high with numerous rigid spreading branches, armed with strong triple spines below the leafy fascicles, 3—5 lines apart; outer bark smooth and light brown on one or two year old branches, but becoming loose and silvery with age; leaves and inflorescence hirsute, some of the hairs bearing glands; leaves ¼—½ in. broad, deeply 5-parted, the lobes incised and toothed; racemes 3—6-flowered, bracts cordate, acuminate; calyx about ¼ in. broad, its rounded lobes spreading from place of insertion on ovary; petals minute; stamens less than a line long; anthers broader than long, deeply lobed; red berries glandular-hirsute, 2—3 lines in diameter, containing 1—3 large seeds.—Collected Aug. 16, 1893, on summit of Mt. San Antonio, 10,000 ft. altitude, among dry exposed rocks.

AMERICAN SPECIES OF WULFENIA.

By Edward L. Greene.

This genus was first recognized by Jacquin, and was published in 1781, the type being a perennial herb of the Carinthian Alps which, but for its peculiar habit, would have been received as a species of *Veronica*. In *Veronica* the stems are leafy and the leaves usually opposite; the flowers being axillary to either leaves or bracts, and either solitary or clustered. In *Wulfenia* there is no proper stem above ground, and the leaves are clustered as if radical but in reality proceed from a short subterranean stem, while from amid the leaves spring one or more scape-like spicate or racemose-bracted peduncles. There is no character of flower or fruit by which *Wulfenia* may be distinguished from *Veronica*.

For about fifty years after the discovery and publication of *Wulfenia Carinthiaca*, only this one species was known; though under the influence of the botanical empiricism then still prevailing in many quarters, as an inheritance from the Linnæan age, several authors sought to transfer to *Wulfenia* certain species of *Veronica* and *Bonarota;* all of which, as being quite at variance with *Wulfenia* in respect to habit, have long since been remanded to their proper genera.

In 1835 Mr. Bentham published, in the *Scrophularineæ Indicæ*, two new species genuinely congeneric with *Wulfenia*—namely, *W. Amherstiana* and *W. reniformis;* the one an Asiatic, the other a North American plant. Henceforward none could treat the genus as monotypical. And now, within ten years from the time of issue of Bentham's important paper thus briefly mentioned, three other plants, of the *Wulfenia* facies and mode of growth, were discovered in western North America. One of these, being destitute of a corolla, was published by Sir William Hooker, as *Gymnandra rubra;* a somewhat grave error, since the genus *Gymnandra*, though somewhat resembling *Wulfenia*, is so different in character as long to have been recognized as belonging to another natural order of plants. The other two American Wulfenias were published in the tenth volume of DeCandolle's *Prodromus*, by Mr. Bentham, as members of a genus *Synthyris*, now proposed by him as new and made to include all the North American species of *Wulfenia* then known.

That at the date of his publishing *Synthyris*, Mr. Bentham's mind—like that of many another botanist of that time—was governed by Linnæan principles of an artificial classification, is well shown by the fact that his best character for the new genus is the 4-parted calyx; this organ being 5-parted in *Veronica*. But in truth, more than one of his *Synthyris* species is now known to have the calyx sometimes, if not always, 5-parted; and in *Veronica* itself some species have a 4-parted, others even a 3-parted, calyx. The other character for *Synthyris*—and it was upon this which he rested most hopefully, in 1866, thirty years subsequent to his first proposing the genus—is its plane seeds, those of his *Wulfenia* being concavo-convex. But of what use is the attempt to make of such diversities generic characters, especially in the Scrophularineæ? In *Collinsia*, in *Antirrhinum*, and even in *Veronica*—and in these genera as accepted by Bentham himself—some species have plane seeds, others seeds plano-convex and even concavo-convex. And Asa Gray, seeing the weakness of *Synthyris* and yet not being willing to abandon it, after its author had reasserted it in the *Genera Plantarum*, makes mention in the *Synoptical Flora* that in *Wulfenia* the anther-cells are confluent—in *Synthyris* not so. But then, both these phases of the anther-cells are present in *Pentstemon* as received by both Gray and Bentham. In short, *Wulfenia*, including in it the American species, is a genus far more natural and satisfactory, exhibiting far less diversity of habit and of character than either *Pentstemon* or *Veronica*. The combination of the two, *Wulfenia* and *Synthyris*, under the prior name, is therefore logically inevitable and a scientific necessity. I have long seen this, but only lately, in the *Manual of the Bay-Region Botany*, have I given some expression of my mind. The North American species I here attempt to enumerate.

1. **W. rotundifolia.** *Synthyris rotundifolia*, Gray, Syn. Fl. 285 (1878).—Oregon pine woods, along the Columbia and Willamette rivers.

2. W. CORDATA, Greene, Man. 280 (1894). *Synthyris reniformis*, var. *cordata*, Gray, Bot. Calif. i. 571 (1876).—Open rocky slopes of the higher coast mountains in California, from Marin Co. to Mendocino.

3. W. RENIFORMIS, Dougl. in Benth. Scroph. Ind. 46 (1835). *Synthyris reniformis*, Benth. in DC. Prodr. x. 454 (1846).—Western Oregon and adjacent Washington.

4. **W. pinnatifida.** *Synthyris pinnatifida*, Wats. Bot. King. Exp. 227 (1871).—Utah to Idaho.

5. **W. alpina.** *Synthyris alpina*, Gray, Am. Journ. Sci. 2 Ser xxxiv. 251 (1862).—High Rocky Mountains of Colorado.

6. **W. plantaginea.** *Synthyris plantaginea*, Benth. in DC. Prodr. x. 454 (1846). *Atelianthus veronicoides*, Nutt. in herb., *teste* Benth. l. c. Mr. Bentham, upon his own testimony, violated a long recognized principle of right, in declining to publish Nuttall's name *Atelianthus* for this supposed genus, and coining in its stead the new name *Synthyris*.—Species of extended range on high plains and low mountains of Wyoming, Colorado and New Mexico.

7. **W. Houghtoniana.** *Synthyris Houghtoniana*, Benth. l. c.—Region of the Great Lakes.

8. **W. rubra.** *Gymnandra rubra*, Dougl. in Hook. Fl. ii. 103 (1838). *Synthyris rubra*, Benth. l. c. (1846).—Eastern Oregon to northern Utah and northward.

CALIFORNIAN FIELD NOTES.—IV.

By Anstruther Davidson, M. D.

Northern species near Los Angeles.

On the trail to Mount Wilson, one of the highest points of the Sierra Madre range north of Los Angeles, there grows at an altitude of about 2500 feet a clump of ARBUTUS MENZIESII, the only one recorded for the southern section of the State.

While there is nothing unusual in the erratic distribution of some species or the occasional intrusion of species into belts far removed from their normal range, yet the presence of the Arbutus here is rendered more than usually interesting because of other northern and rare species that accompany it, and that in this part of California seem to be limited to this particular altitude and locality.

POLYGALA CORNUTA, Kell., is the first of these. The specimens here found are low shrubs with branches trailing to a distance of four or five feet. The sepals are characterized by the absence of the usual pubescence, but in all other respects except size it appears to conform closely to the type. The range of the species as recorded in the *Flora Franciscana* is "in the Sierra Nevada at middle altitudes from El Dorado Co. northward." Though it is here far removed from its accredited habitat, this may not be an isolated instance, since the State Survey Botany informs us that Dr. Torrey ticketed specimens of his own as from Santa Barbara. While the authors considered this probably a mistake, they may, in view of the above discovery ultimately prove to have been correctly labelled.

A short distance west of the Arbutus and at the same altitude two other plants exist, in a few specimens, which are worthy of note.

GITHOPSIS DIFFUSA, Gray. First discovered by Mr. Parish in the Cucamonga Mountains in 1881, it has since been recorded in the *Manual of the Bay Region* as ranging from the Vaca Mountains southward, from which one would infer that it is not infrequent in the north: this is only its second known station south of the Tehachapai Mountains. In the same locality grows a *Senecio*, tall and stout, about three feet high, and affecting the shade of the *Quercus dumosa* among which it grows. It belongs to that series of which *S. aronicoides* is the common type, and is closely related to *S. astephanus*, Greene; exactly resembling it in the form of the leaf, but differing from it in the amount of the pubescence and in the character of the inflorescence. It may seem to some impolitic to propose as a new species what may be but a form of *S. astephanus*, but while the differences are not great they are probably as good specific characters as many of the species of this series can show; so for the present it may be named

Senecio ilicetorum. Stems erect, from a biennial or perennial root, 1½ to 3 feet high, very floccose-woolly, at length glabrate above: radical leaves at first floccose beneath, thin, ample, undivided, 8 to 12 inches long, including the petiole, elliptic oblong, acute at both ends, coarsely dentate, the teeth spreading, triangular, callous-tipped, the sinuses rounded and the larger of them denticulate; lower cauline leaves resembling the radical, with very short petioles rapidly becoming sessile, the uppermost narrow lanceolate entire or irregularly dentate: head ½ to ¾ of an inch in diameter, and less than ½ an inch in depth, nearly sessile, 6 to 10 in number, closely crowded on the top of the peduncle: scales of the involucre lanceolate acuminate, with few calyculate ones at the base: rays none: all the flowers fertile. Flowering end of May and beginning of June. The type specimens are in the herbaria of Harvard University and of Professor Greene.

AN EDITORIAL ON SOME EDITORIALS.

It is possible that in some far off future age, men will look back to our own epoch as one in which there was singular devotion to high ideals; in which people were wholly absorbed in the most enthusiastic pursuit of pure science, and deep learning, willing to forego bodily comforts and luxuries in the pursuit of these ends, and scorning pelf. Such possible future readers—sadly misunderstanding the real spirit of our time—might commend the *Botanical Gazette's* recent appeal for the recognition of cash values in botany; though I doubt if a critical reader, in any conceivable situation, could approve the editorial holding up for commendation, of "A well known botanist, who has occupied a public position for many years," which man is so little of a true scientist, and so abject and vulgar a mercenary that he prefers to do without books, and without all other facilities for the upbuilding of his department and the advancement of botany, rather than, by asking for these things, remind his superiors of his official existence, and so endanger his tenure of a lucrative office!

I sincerely hope that the man, whoever he may be, who made the confession thus published editorially to the world, is somewhat better, more respectable scientifically, than the short diagnosis makes him; but if he is really so little of a true scientist, and is in such slavish fear of losing the "commercial value" of his office, then I venture to say that the scorned "politicians" are fully worthy to be his superiors, and even that they might serve botany a good turn by declaring vacant the office of such a botanist.

But if the public commendation of this type of botanist is to be deprecated, the attempt make of him a lineal and legitimate descendent of the "scholarly recluse" of "the old days," is more so. "This feeling is a survival from the old days when the botanist was a scholarly recluse." I repeat it, that proposition is most wonderful. This modern botanical smatterer and political wire-puller who, by diplomacy, obtains an office, from the holding of which botanical experience and learning are an inference, has in him no survivals of the feelings that were in scholarly and genuine botanists. He is no more descended from this ancestry than the earth worm is descended from the eagle.

We second, heartily, the commendation of the botanist of the present who has "emerged from his herbarium den," and who is occasionally seen in "cultivated fields" as well as in "thickets and out-of-the-way marshes;" but in the paragraph whence I take these words, history is contradicted in the assumption that this phase of botanical investigation is of recent development. It was the method, precisely, of all those immortal botanists, the great pre-Linnæans. It is even upon clear record that Linnæus was the first man to describe new species on herbarium materials alone, and that he was sharply critized by some of his elders and betters for setting the example of so dangerous a practice as that of founding species on plants that he had never seen alive.

Since I am writing an *argumentum ad editorem*, it will scarcely be in the nature of a digression for me to here cite another reason why the *Gazette* editorial bench would seem to do well in making soon a bibliological retreat; taking up, for a change, a short season of recluse life, and reading a little back of Linnæus. They have in this very April issue, which I am commenting on, permitted one of their contributors to stultify himself by announcing as a *new discovery*, the fact that *Ranunculus acris* is an acridly poisonous plant ! ! ! All this was so commonly known centuries before Linnæus that the species had, almost from the earliest records of it, the name *acris* from this very quality.

Again: our editorial friends in noticing Mr. John Briquet's recent paper on nomenclature, unadvisedly place this botanist—where he does not belong—in the ranks of those who would exclude pre-Linnæan authors from all place in plant nomenclature. Yet they translate him as taking Ray's *Methodus* (1703) for one starting point. I hope my friends will not take it upon my *dictum*, but they will some day find out, by original research, that all Ray's writings are pre-Linnæan; they may then feel assured of having done some injustice to Mr. Briquet.[1]

I am loath to make reference to that review, not ungenerous nor unkindly in its general tone, with which the *Gazette* friends have complimented my new *Manual*. It is true they charge me with having omitted an index; but this charge is due to an oversight. The index is verily present in all the copies issued. They are a trifle unjust in requiring that I should have given synonyms. No books of descriptive botany for school children and amateurs have synonyms; see, for example, Gray's Manual, Coulter's—everybody's. Why, I repeat it, require *me* to go to all that trouble and expense, from which other people are allowed immunity? I knew there were in California botanical students of some experience who wish for synonyms by which to make easy the recognition of some species under new names. But I really thought all such might better learn the application of new names by attending to the terms of the diagnoses. There is another class of botanists whom I am wont to think of as learned botanists, and these usually carry a great number of synonyms in their heads. I thought that in the Botano-ethnic taxonomy all editors held places in this rank, and that none would be so humble as to claim place with those whom I expected to become clamorous for synonyms.

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[1] Since they were dealing with this paper of Briquet, they might kindly have informed him that, in his *Andibertiella* he has created a synonym for Professor Greene's RAMONA.

But again: the *Gazette* is unfair in demanding that I shall follow the Candollean sequence of orders. One or more of that journal's editors is now helping edit a new catalogue which clashes more than my *Manual* does with that sequence. Who am I that I should be condemned for using the liberty taken by *Gazette* editors themselves, and granted to all other botanists, of expressing views at variance with those who maintain the antiquated Candollean ordinal sequence?

There is one respect in which my poor little *Manual* lies above the *Gazette's* range of capabilities of criticism; and that is the one on which they have had the indiscretion of attempting to say much, namely, the pre-Linnæanism of it. They protest "against the use of pre-Linnæan names." This, if words have their usual plain meaning, is the most revolutionary protest which I have read in all the discussions of questions of nomenclature. Are pre-Linnæan names to be excluded from botany? These editors are not revolutionists, and are not to be thought of as having meant to offer any such protest as they say they do make. But the question remains: what did they wish to say? Equally in need of an explanatory paragraph is the strange concluding sentence of the *Manual* review. It seems not to have been intended to assert anything. Was it designed for rhetorical effect only? Mere rhetoric, to have botanical force, would need to be of higher grade.—E. L. GREENE.

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EDITED BY

WILLIS LINN JEPSON

AND OTHERS, OF THE DEPARTMENT OF BOTANY,
UNIVERSITY OF CALIFORNIA.

CONTENTS:

PAGE
Observations on the Compositæ—VI., - - *Edw. L. Greene* 89
Notes on Californian Bryophytes, - - *Marshall A. Howe* 97
A New Species of Diplacus, - - - - *J. Burtt Davy* 101
Notes on West American Coniferæ, - - *J. G. Lemmon* 102

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OBSERVATIONS ON THE COMPOSITÆ.—VI.

By Edward L. Greene.

[Chrysopsis continued, from p. 76].

There is one other type, still received as of this genus, which were perhaps more consistently removed from it; I refer to *C. pilosa*, Nutt., a not well known member of the Arkansas flora. The plant is annual, rather tall and coarse, and with more likeness to *Heterotheca* than to true *Chrysopsis*. Its involucral bracts are so nearly equal as to give a suggestion of *Erigeron*, and they are flat, not carinate. The paleæ of the outer pappus are very conspicuous, and somewhat erose. The achenes are so distinctly ten-ribbed—at least those of the ray—that the ribs are manifest even through the somewhat dense pubescence. These are the characters of a genus, apparently. The living plants I have not seen.

The geographic range of *Chrysopsis* is somewhat peculiar. The species are, in a manner, dispersed over a considerable part of the North American continent, but in general only along the lines of the mountain elevations, or between these and the seaboard. They are absent from the level interior parts of the continent, and also from the higher latitudes. None occur in the great prairie and low forest regions of the middle Mississippi and its tributaries. They are likewise wanting on the desert plains of the Great Basin, though not absent from the mountain districts adjacent to such plains.

There are two groups of species, quite separate in their respective geographic ranges, and with corresponding organographic differences. One of these is of the Appalachian Mountain system, with members dispersed from eastern Massachusetts to Mexico. The other has for its center of distribution the Rocky Mountain region. One of its species runs eastward over the high plains quite to the verge of the prairies, northward into British America, and west-

(1840).—Oregon and Washington. Plant with the fastigiate-cymose inflorescence of true *Chrysopsis.*

25. C. RUDIS, Greene, Man. 174 (1894).—Almost throughout California. In pubescence, mode of branching, and other particulars entirely distinct from the last; even bearing but little general resemblance to it. The variety **scaberrima** (*C. Oregana* var. *scaberrima*, Gray, Syn. Fl. 124) is said to have small leaves, and to be very hispid. It is of a more southerly station, and perhaps specifically distinct.

++ ++ *Flaccid and smooth subalpine species with open inflorescence.*—Subgenus OREOBIA.

26. C. BREWERI, Gray, Proc. Am. Acad. vi. 542 (1865).—Northern and middle Sierra Nevada, California.

27. C. WRIGHTII, Gray, Syn. Fl. Supplem. 446 (1886).—High mountains of southern California.

A number of plants, wrongly included in this genus by Nuttall, and by Elliott, were excluded by DeCandolle; but the following, added more recently to *Chrysopsis*, easily admits of another disposal. I shall call it

Erigeron Mendocinus. *Chrysopsis andicola*, Philippi, Anal. Univ. Chil. ii. 398 (1862); Linnæa, xxxiii, 131. From Dr. Philippi's description alone we inferred that this plant would be an *Erigeron*. The very numerous and narrow rays, blunt style-tips, etc., seemed to imply as much; for with us who know the several yellow-flowered North American Erigerons, the color of flowers in this plant would not be misleading. The one good specimen which I have seen shows the species to be a near relative of our Californian group of Erigerons, having leafy stems, and terminal solitary or corymbose heads—a group in which most of the species are destitute of rays. There is an earlier *Erigeron andicola*, DC.

What appears to me as another excellent natural genus of plants, the type species of which is merged in "*Aplopappus*" by Asa Gray and Mr. Bentham, is Nuttall's

ERIOCARPUM. Its various species have been distributed partly to "*Aplopappus*" and partly to *Aster*, according as the rays were found to be xanthic or cyanic. The habit of this genus is well marked, but it embraces perennial and annual species. Its character is precisely that which distinguishes *Sericocarpus* from *Aster*, and much like that by which *Brachychæta* is separated from *Solidago*. Or again; it is separable from all its near allies just as *Acamptopappus* from the shrubby "*Aplopappi*." The character is a densely silky, mostly short and turbinate achene, with pappus of exceedingly unequal usually short and somewhat flattened awn-like barbellate bristles, which, in their maturity, in most of the species (perhaps in all) are inclined to spread away somewhat radiately around summit of the achene. To these characteristics it is to be added that both pappus and indument of achene are permanently white, or at least, nearly white.

With these good characters of fruit, an almost constantly hemispherical involucre, and peculiarly spinulose-toothed foliage, the genus is thoroughly acceptable; and not the less so as adding another to the list of those in this tribe in which, as in *Lessingia*, *Pentachæta* and *Erigeron*, some species have yellow, others purple ray-flowers. The cyanic species bring the genus near to *Machæranthera;* and Nuttall had even some of the xanthic ones in his *Dieteria*, a synonym of *Machæranthera*.

In the following arrangement of the species of ERIOCARPUM, the yellow-rayed group holds the first place, for the reason that those nearest to Nuttall's type are homochromous, though that type itself is rayless.

* *Rays when present yellow.*

+ *Perennial or suffrutescent species.*

1. E. GRINDELIOIDES, Nutt. Trans. Am. Phil. Soc. vii. 321 (1840). *Aplopappus Nuttallii*, Torr. & Gray, Fl. ii. 242 (1842). *Aster Nuttallii*, O. Ktze. Rev. Gen. 318 (1891)

Rocky Mountain region, from Arizona and New Mexico northward to borders of British America, at considerable elevations.

2. **E. spinulosum.** *Amellus spinulosus*, Pursh, Fl. ii. 564 (1814). *Diplopappus pinnatifidus*, Hook. Fl. ii. 22 (1834). *Aplopappus? spinulosus*, DC. Prodr. v. 347 (1836). *Dieteria spinulosa*, Nutt. Trans. Am. Phil. Soc. vii. 301 (1840). *Aster pinnatifidus*, O. Ktze, Rev. Gen. 316 (1891). In this species the technical characters of the genus are less pronounced than in any of the others; for the achenes are neither turbinate nor very densely silky-tomentose. The pappus is also more slender, but its bristles are so remarkably unequal that Sir William Hooker placed the plant under *Diplopappus*. In habit it is so wholly like the rest of the group that it can not be separated from them. From the succeeding species, which has hitherto been confounded with it, the canescently tomentose character of the herbage, as well as the mode of growth, thoroughly distinguishes it. —Plains of the middle and northern Rocky Mountain regions, eastward to Iowa and Minnesota.

3. **E. australe.** Perennial, the clustered stems erect or ascending, 6 to 18 inches high, not tomentose but pale and rough with a short spreading somewhat glandular indument: radical leaves pinnatifid, the lobes with few coarse teeth; cauline narrow, pinnately toothed: heads few, solitary at the ends of leafy pedunculiform branches: rays pale yellow: achenes compressed: pappus-bristles not coarse, extremely unequal.—Texas, New Mexico, Arizona and adjacent Mexico. Strangely confused with the last, in herbaria; very distinct from it, and nearer the species following.

4. **E. junceum.** *Aplopappus junceus*, Greene, Bull. Calif. Acad. i. 190 (1885).—Species of the mountains of San Diego Co., Calif., and adjacent Lower California.

5. **E. scabrellum.** Suffrutescent, the leafy flowering branches rather slender, and with a short hirsutulous pubes-

cence, the foliage scabrous: leaves narrowly oblong, ¾ inch long, sharply and saliently toothed: heads solitary at the ends of bracted pedunculiform branches: rays light yellow: achenes very pubescent: pappus shorter and more aristiform than in the preceding.—Los Angeles Bay, Lower California. *Edward Palmer*, 1887, n. 539.

+ + *Annual species.*

6. **E. gracile.** *Dieteria gracilis*, Nutt. Pl. Gamb. 177 (1848). *Aplopappus gracilis*, Gray, Pl. Fendl. 76 (1849). *Aster Dieteria*, O. Ktze. l. c. 315.—Western Texas and northern Mexico to Northern New Mexico and Arizona.

7. **E. stenolobum.** Annual, erect, stoutish, a foot high, simple up to the few subterminal monocephalous branches: pubescence scanty, of short spreading usually gland-tipped hairs: leaves bipinnately divided into narrowly linear segments: involucre ¾ inch broad, the bracts narrowed into slender herbaceous squarrose tips: rays light yellow: achenes turbinate, densely silky: pappus scanty, the longer bristles very distinctly flattened and almost subulate.—A Mexican species, collected and distributed by Mr. Pringle under the name *Aplopappus tenuilobus*, which, fortunately has remained a *nomen nudum*—*tenuilobus* being one of those inadmissable hybrid adjectives which Dr. Gray himself condemned, as all scholars must.

* * *Rays red, or purplish.*

8. **E. gymnocephalum.** *Aplopappus gymnocephalus*, DC. Prodr. v. 346 (1836). *A. blephariphyllus*, Gray, Pl. Wright. i. 97 (1852). *Aster gymnocephalus*, Gray, Proc. Am. Acad. xv. 32 (1880).—Both DeCandolle and Asa Gray at first believed the rays of this plant to be yellow; the latter afterwards judged them to be red, and our specimens show them to have been of a sort of rose-red. It is not impossible that they may vary from yellow to red in the species, or that two species may be lurking under this name. In the text of the *Plantæ Wrightianæ* Dr. Gray observed that if

the rays had been of any other color than yellow, the plant would have been a *Machæranthera.* But that genus has not the short pappus of unequal awn-like bristles found in this species; neither has it the densely silky achenes.—Southwestern Texas and adjacent Mexico.

9. **E. Coloradense.** *Aster Coloradoensis*, Gray, Proc. Am. Acad. xi. 76 (1875). This was also referred by Dr. Gray to his *Machæranthera* section of *Aster.* It is much more like a *Townsendia* in habit; but it has the achenes and pappus of the present genus, as also the spinulose-toothed foliage.—South Park, and elsewhere among the mountains of southern Colorado.

Undoubtedly through the last three species of the foregoing enumeration, the contact is somewhat close between *Eriocarpum* and *Machæranthera*, though the technical character is good, so that by it species may be referred without hesitation to the one or the other, without reference to color of rays.

There remain a few species of Gray's "*Aplopappus*" which perhaps ought to be referred to *Eriocarpum*—species of which I have access to no specimens, and upon which I can not at present pass an opinion.

One more genus, much like *Eriocarpum* as to achenes and pappus, but very unlike it in habit, I felt the necessity of restoring while engaged upon the *Manual of Bay Region Botany;* that is ISOCOMA. Differing from all the "*Bigelovias*" of Asa Gray in the three points of an inflated and closed corolla, silky-canescent achenes, and short awn-like unequal pappus-bristles, it forms a group so natural that in the *Synoptical Flora* it is retained in its integrity as a subgenus Aplodiscus of "*Bigelovia;*" but the "*B. veneta*" of that volume is a bad mixture of several distinct species.

1. I. VERNONIOIDES, Nutt. Trans. Am. Phil. Soc. vii. 320 (1840). *Pyrrocoma Menziesii,* Hook. & Arn. Bot. Beech. 351 (1841). *Aplopappus Menziesii,* Torr. & Gray, Fl. ii. 242 (1842). *Linosyris dentata,* Kell. Proc. Calif. Acad. ii.

16 (1863).—Of low subsaline plains in the southern parts of California, but more generally along the seaboard, and on the coast islands, southward to Cedros.

2. I. ARGUTA, Greene, Man. 175 (1894).—Plains of the lower Sacramento, California; also in lower foothills of the Vaca Mountains; collected only by *Jepson.*

3. **I. veneta.** *Baccharis veneta*, HBK. Nov. Gen. et Sp. iv. 68 (1820). *Aplopappus discoideus*, DC. Prodr. vi. 350 (1836). *Linosyris Mexicana*, Schl. Hort. Hal. 7, t. 14 (1841). *Bigelovia veneta*, Gray, Proc. Am. Acad. viii. 638 (1873), not of Syn. Fl. *Aster venetus*, O. Ktze. Rev. Gen. 318 (1891).—Mountains of Mexico.

4. **I. Hartwegi.** *Bigelovia Hartwegi*, Gray, in Hemsl. Biol. Centr.-Am. Bot. ii. 115 (1881); Syn. Fl. 143. *Aster Hartwegi*, O. Ktze. l. c.—Southern Arizona and adjacent Mexico.

5. **I. tridentata.** *Bigelovia tridentata*, Greene, Bull. Torr. Club. x. 126 (1883).—Cedros Island.

6. **I. acradenia.** *Bigelovia acradenia*, Greene, l. c. *Aster acradenius*, O. Ktze. l. c.—Mohave Desert.

7. **I. Drummondii.** *Linosyris Drummondii*, Torr. & Gray, Fl. ii. 233 (1842). *Bigelovia Drummondii*, Gray, Proc. Am. Acad. viii. 639 (1873).—Along the Texan seaboard.

8. **I. coronopifolia.** *Linosyris coronopifolia*, Gray, Pl. Wright i. 96 (1852). *Bigelovia coronopifolia*, Gray, l. c. 638 (1873).—Texas to southern Arizona.

9. **I. heterophylla.** *Linosyris heterophylla*, Gray, Pl. Wright, i. 97 (1852). Said to include as mere variations, *L. Wrightii* and *L. hirtella*, Gray. *Aster heterophyllus*, O. Ktze. l. c.—Texas to Colorado and Arizona.

10. **I. pluriflora.** *Linosyris pluriflora*, Torr. & Gray, Fl. ii. 233 (1842). *Bigelovia pluriflora*, Gray, Proc. Am. Acad. viii. 639 (1873).—Southern Colorado. Species probably very local; not collected since Long's Expedition.

Associated with the typical species of *Isocoma* in southern California, is another shrub very like it in foliage and general appearance, but with very different inflorescence and different fruit. I refer to what has usually been called *Aplopappus squarrosus*. When, in 1886, on the islands off the coast of southern California, I discovered those remarkable shrubs to which I assigned the name HAZARDIA, I perceived clearly that with these the so-called *Aplopappus squarrosus* was strictly congeneric. I do not find that any older name exists by which HAZARDIA is superseded. I therefore now propose to transfer to HAZARDIA the shrub I have mentioned, and its next of kin. I strongly suspect that a number of South American shrubs published under *Aplopappus* and *Pyrrocoma* belong here; but I need to see more material of them than is at present accessible.

The character of the genus as given in the first volume of *Pittonia* need only be so altered as to admit some species with well developed ligulate ray-corollas, and others wholly destitute of ray flowers. A good mark of this genus, as contrasted with other plants that have been referred to *Aplopappus*, is the fact that the disk corollas change from yellow to red or purple, as in *Aster*, *Corethrogyne*, etc.

H. squarrosa. *Aplopappus squarrosus*, Hook. & Arn. Bot. Beech. 146 (1833). *Pyrrocoma grindelioides*, DC. Prodr. v. 350 (1836). *Aster grindelioides*, O. Ktze, l. c. —From near Monterey, California, southward to the Lower Californian peninsula, and on the coast islands.

H. Orcuttii. *Aplopappus Orcuttii*, Gray, Proc. Am. Acad. xx. 297 (1885); Syn. Fl. Supplem. 446.—Lower California.

H. Berberidis. *Aplopappus Berberidis*, Gray, Syn. Fl. 126 (1884). *Aster Berberidis*, O. Ktze, l. c.—Lower California.

H. cruenta. *Aplopappus cruentus*, Greene, Pitt. ii. 17 (1889).—Coronados Islands, off the coast of Lower California.

CONTRIBUTION TO THE HISTORY OF ACHYRODES AUREUM.

By J. Burtt Davy.

In the Botany of the Californian State Survey, vol. ii., p. 299, Dr. Thurber states that the first collection of *Achyrodes aureum* in America, was made by Messrs. Parry & Lemmon, who—he adds—discovered it in the Colorado Desert in 1876. Through an attempt to find out more precisely where this discovery was made, I obtained the following additional information about it. Mr. Lemmon writes to me as follows:—"I first discovered the bronze-hued *Lamarckia* near the mouth of Mill Creek, fifteen miles east of San Bernardino, April 3, 1876. The plants stood out solitary, were only about four inches high and the little unilateral spikes with the numerous large golden sterile spikelets waving in the wind, were so beautiful that I gathered all in sight. Dr. Parry and I were on a tramp towards the mountains from Crafton, twelve miles east of San Bernardino. We had one horse only, and were riding by turns. I happened to be riding when we were entering the mouth of Mill Creek Cañon and was a few rods behind Dr. Parry at the time I saw the plant. Dismounting and pulling some specimens I passed on, overtaking Dr. Parry, and showing him the grass asked if he had seen it too. 'No,' he replied jocularly, 'you seem to see plants better the further you are away.' * * * We made several valuable collections in the Colorado Desert and one set of the labels indicated that locality. I presume *Lamarckia* was wrongly reported on one of the latter labels."

Dr. Parry wrote, Thurber remarks, that the grass was found where one would not expect to meet an alien, yet he thought it might have been accidentally introduced.

During the seventeen years elapsed since Mr. Lemmon first found it, this South-European grass has been met with in the following additional localities in California:—

Hills back of Los Angeles, 1879, robust plants a foot high (Lemmon in litt.).

Los Angeles, April 12, 1881, introduced, abundant (C. C. Parry, specimen in herb. Cal. Acad. Sci.).

San Luis Obispo, 1889, abundant (Lemmon in litt.).

Caliente, Kern Co., name of collector and date not stated, (specimen in herb. Cal. Acad. Sci.).

San Jacinto, San Diego Co., May, 1891, (Mabel M. Miles, specimen in herb. Cal. Acad. Sci.).

Near Eden Vale railroad depot, in the Santa Clara Valley, April 17, 1893, on a rocky uncultivated elevation in a grain-field (J. Burtt Davy, specimen in herb. Univ. of Cal.).

From its geographical distribution, as detailed below, and its habit under cultivation in England, it seems probable that the caryopsis of this grass is tender and unfitted to withstand exposure to a rigorous winter, and that it thrives best in a warm dry climate; we may therefore expect to find it ere long in many other localities in California.

The following account of its bibliography and geography is the best I am able to give at this time, but is far from complete, as I have not access to a sufficiently extensive collection of agrostological literature to permit an exhaustive treatment of the subject.

Wherever a reference is not given at first hand, I have cited the author from whose work I obtained it.

ACHYRODES. Boehmer in Ludw. Defin. 420 (1760).

[CYNOSURUS sp., L., Sp. Pl. Ed. i. 73 (1753) Ed. ii. 107 (1762).]

[LAMARKIA, Moënch, Meth. 201 (1794); LAMARCKIA, Koel., Gram. 376 (1802) ex Lam. & DC., Fl. Fr. iii. 30 (1805); Mert. & Koch, Deutsch. Fl. i. 372 (1823); Nees, Gen. i. *t.* 77 (1833–37) ex Benth. & Hook., Gen. iii. 1183 and Thurber in Bot. Cal. ii. 299; Endl., Gen. 101 n. 895 (1837); not *Lamarkia*, Medic., Vorles iv. i. 183 (1789) ex Pfeiffer, Nom. ii. 17; nor *Lamarckia*, Olivi, Zool. Adriat. 258. *t.* 7

(1792) ex Pfeiffer, l. c.; nor *Lamarkea*, Pers., Ench. i. 218 (1805); nor *Lamarckia*, Vahl., Danske Nat. Selsk. Skrivt. vi. 93 (1810) ex Pfeiffer, l. c.; nor *Lamarkea*, Rchb. Consp. 175 (1828) ex Pfeiffer, l. c.; nor *Lamarkia*, G. Don., Gen. Hist. iv. 487 (1837).]

[CHRYSURUS, Pers., Ench. i. 80 (1805); Beauv., Agrost. 123. *t. 22. f. 5* (1812) ex Benth. & Hook., Gen. iii. 1183; Roem. & Schult., Syst. ii. 50 (1817); Trin., Agrost. 162 (1820) ex Host., Fl. Austriaca i. 70; Rchb., Ic. Fl. Germ. t. 58 (1834–70) ex Benth. & Hook., l. c.]

[PTERIUM, Desv., Journ. de Bot. i. 75 (1813) ex Benth. & Hook., l. c.; *cf.* Endl., Gen. 109 ["Journ. Bot. iii. 75 (1813)" ex Pfeiffer, Nom. ii. 868].]

[TINAEA, Garzia, Relaz. degli anni 3 et 4 della Accademia de' zelanti di Aci Reale p. 24 ex Pfeiffer, Nom. ii. 1419 (1874).]

A. AUREUM, O. Ktze., Rev. Gen., Pars ii. 758 (1891).

Gramen aureum, Dalech., Hist. Gen. Pl. (1554 and 1587) [sometimes cited as "Dalech. Lugd."] ex C. Bauh., Pin. 3; Dalech., l. c. 430 (Ed. of 1686) ex. L. Ger., Fl. Gall. 103.

Gramen panicula pendula aurea, C. Bauh., Pin. 3 (1671) [Ed. i. 1623, I have not seen], Theatri Botanici sive Historia 33 (1658) [not Prodromos Theatri Botanici (1620 and 1671)] ex L., Sp. Pl. Ed. i. 73; Scheuchz., Gram. 149 *t. iii. f. 12* (1719 and Haller's Ed., 1775; (I have seen the latter only).

Gramen Barcinonense, panicula densa aurea, Tourn., Inst. 523 (1700); Shaw, Afric. 232 *f. 232* (1738?) ex L., Sp. Pl. Ed. ii. 107.

Gramen sciurum seu *alopecurum minus*, *heteromalla panicula*, Barrelier, Pl. Icon. 107 *f. 4* (1714) [frequently cited "Barr. rar."].

Gramen phalaroides, panicula ex tenuissimis locustis fere sericeis congesta, Monti, Prod. Gram. 46 *Ic. 40* (1719) ex L. Ger., Fl. Gall. 103.

Cynosurus aureus, L., Sp. Pl. Ed. i. 73 (1753) Ed. ii. 107 (1762); Lam., Fl. Fr. iii. 618 (1778); Icon. Taur. xiv. *t. 39* ex All., Fl. Ped. ii. 241 (1785); All., l. c.; Houttuyn., Linn. Pfl. Syst., Theile xii. 389 (1785) ex Willd., Sp. Pl. i. 418 (1797); Willd., l. c.; Desf., Fl. Atl. i. 84 (1798–1800) ex Lam. & DC., Fl. Fr. iii. 30; Host., Gram. Austr. iii. *t. 4* (1805) ex Benth. & Hook., Gen. iii. 1183; Schrad., Germ. i. 317 (1806) ex Kunth, Enum. i. 390; Sibth., Fl. Græc. i. 62 *t. 79* (1806) ex Roem. & Schult., Syst. ii. 806; Sibth., Fl. Græc. Prodr. i. 59 (1806); Ait., Hort. Kew Ed. ii. i. 163 (1810); Loisel., Fl. Gall. Ed. ii. i. 68 (1828); *not* (?) *of* Georgi, Geog. phys. u. nat. Beschr. d. Russ. Reich. iii. Theile iv. 695 (1797–1802) ex Ledeb., Fl. Ross. iv. 444.

Lamarkia aurea, Moënch. Meth. 201 (1794).

Lamarckia aurea, Koel., Gram. 376 (1802) ex Lam. & DC., Fl. Fr. iii. 30 (1805); Lam. & DC., l. c.; DC., Cat. Hort. Monsp. 1813, p. 120; Mert. & Koch, Deutsch. Fl. i. 630 (1823); Kunth., Enum. i. 389 (1833), Suppl. 324 (1835); Schrad., Reliq. Schrad., in Linnæa xii, 455 (1838); Dietr., Syn. i. 372 (1839); K. Koch in Linnæa xxi. 393 (1848); Benth., Fl. Austral. vii. 636 (1878); Thurber in S. Wats. Bot. Cal. ii. 299 (1880); Boiss., Fl. Orient. v. 570 (1884).

Chrysurus cynosuroides, Pers., Ench. i. 80 (1805); Beauv., Agrost. 123. *t. 22. f. 5* (1812) ex Kunth, Enum. i. 390; Roem. & Schult., Syst. ii. 806 (1817); Presl., Cyp. et Gram. Sicul. 32 (1820); Host, Fl. Austriaca i. 70 (1827); Boiss., Fl. Orient. v. 570 (1884).

Chrysurus aureus, Beauv., Agrost. 123 (1812) ex Kunth, Enum. i. 390; J. Don, Cat. Cant. Ed. x. 30 (1823); Spreng., Syst. i. 296 (1825); Rchb., Ic. Fl. Germ. (1834–70) *t. 149* ex Thurber in S. Wats. Bot. Cal. ii. 299; Rchb., l. c. *t. 58* ex Benth., Fl. Austral, vii. 636 and Benth. & Hook., Gen. iii. 1183; Rchb., l. c. *fig. 367* ex Boiss., Fl. Orient. v. 570; Sweet, Hort. Brit. 742 (1839).

Pterium elegans, Desv., Journ. de Bot. 1813 p. 75, ex Benth. & Hook., l. c., by inference.

Varieties: Dr. Kuntze distinguishes a plant found by him on the islands of Teneriffe and Palma, in the Canaries, as *A. aureum* var. *variegatum*, on the ground that in a *young state or alwags*, the bases of the glumes [and] palets are subviolaceous, whereas—he says—in the normal form the inflorescence is pale greenish and concolorous. All my specimens exhibit more or less purple coloring at the base of the palets, especially those of the sterile spikelets; but this tint appears to be developed with *age*, being visible throughout the panicles only at their maturity, and totally absent from those which are just emerging from the sheath, while panicles in intermediate stages of development have the spikelets of the upper portion, tinted, and of the lower, concolorous. Of the nine specimens in the herbarium of the California Academy of Sciences, in San Francisco, nearly all exhibit a purple tint on the palets, but some specimens are so bleached that this can be seen only with difficulty: some, however, show it very clearly, especially those from Sardinia, Hyeres, and San Jacinto.

Distribution: Spain (*Roem. & Schult.; DC., Cat. Hort. Monsp.*): France, Provence (*Lam.; Loisel.*), Bormes, Var (*Herb. Cal. Acad. Sci.* v. s. sp.), near Barcelonnette, Basses-Alpes (*Tourn.* ex *Lam. & DC.*), around Nice (*All.*), Mt. Viso [?] and Hyeres [?] (*Herb. Cal. Acad. Sci.* v. s. spp.), the Hyeres Islands (*L. Ger.*): Sardinia, in Gallura, the northern-most quarter (coll. *Reverchon*, *Herb. Cal. Acad.*

Sci. ex *Herb. Ball*, v. s. sp,): Corsica (*Loisel.*)*:* Italy (*Roem.* and *Schult.; DC.*, *Cat. Hort. Monsp.*), at Rome (*Barrelier*)*:* Austria; Kalkboden in Banat (*Koch.*), Istria (*Host.; Mert. & Koch*), Dalmatia and the islands of the Adriatic (*Host*)*:* Greece and the Grecian archipelago (*Spruner & Heldreich*, ex *Boiss.; Sibth.*)*:* Thracia, at Byzantium (*Grisebach*, ex *Boiss.*)*:* Anatolia, (*Aucher Eloy & Balansa*, ex *Boiss.; Sibth.*)*:* Cyprus (*Sibth.*): Levant (*Ait.; Don; Sweet*)*:* Syria, at Damascus (*Gaillardot*, ex *Boiss.*)*:* Palestine (*Boiss*)*:* Southern Persia (*Kotschy No. 86*, and *Haussknecht*, ex *Boiss.*)*:* Afghanistan (*Benth. & Hook.; Griffith* ex *Boiss.*)*:* Egypt, at Alexandria (*Ehrenberg* ex *Boiss.*)*:* Abyssinia (*Boiss.*)*:* Barbary (*Pers.; Kunth; Schrad.; Dietr.*); Algeria, at Bona (*Dr. Dukerley*, v. s. sp.): Madeira (*Boiss.*) and the Canary Islands, (*Benth & Hook.; Boiss.; O. Ktze.*), Teneriffe (*Herb. Cal. Acad Sci.*, v. s. sp.; *O. Ktze.*)*:* California, Mill Creek, San Bernardino Co. (*Lemmon* v. s. sp.); Los Angeles (*Lemmon; Parry*, v. s. sp.); San Luis Obispo (*Lemmon*)*;* Caliente, Kern Co., (*Herb. Cal. Acad. Sci.* v. s. sp.); San Jacinto, San Diego Co., (*Miles*, v. s. sp.); Santa Clara Valley, (*Davy*)*:* Australia and Tasmania (*Sir F. von Mueller*, *Fragm. viii. 116* ex *Benth.*)

General geographical range: the Mediterranean region, extending east to Southern Persia and Afghanistan; Madeira and the Canary Islands; elsewhere probably introduced accidentally or by cultivation.

Habitat: arid places, as among rocks and on steep craigs, in sandy pastures, and by roadsides; frequently near the sea.

Flowering period: April (California), May and June (S. Europe), July (England). An annual.

Uses: this elegant little grass is well worthy of garden cultivation, and by English seeds-men is usually included in catalogues of ornamental grasses. It was introduced into cultivation in England in the year 1700, by M. Richard, from the Levant (according to Aiton). In England it has been found to grow best when sown in pots in August or September, and sheltered from winter frosts in a cold frame or green-house, though it will thrive if sown in an open border in March or April. I am not aware that it has any agricultural value.

Barrelier's note on the habitat of his plant is of historical interest; he says "it was met with once near the Colloseum, upon the tops of the walls of the vineyard of Cardinal Pius, towards the end of May, with mature dried and bleaching spikes."

NOVITATES OCCIDENTALES.—VII.

By Edward L. Greene.

Lupinus fallax. Shrubby, 3 to 5 feet high, branching from above the base of the trunk-like stem, the branches ascending: branches, foliage and inflorescence all silvery with a velvety-silky pubescence: stipules linear-subulate, ½ inch long or more, deciduous; petioles hardly as long as the 7 to 9 linear-lanceolate acute leaflets, these 1½ to 2½ inches long: racemes distinctly peduncled; bracts slender, straight, very long and conspicuous before the flowering, caducous: flowers distinctly whorled; banner and wings about equal, the latter deep violet, the former with middle portion white, changing to red; keel woolly-ciliate above the middle: pods spreading, velvety, about 6-seeded: seeds small, dark-colored, scarcely compressed.

This excellent new lupine is the one which in the *Manual* I mentioned under the name and description of *L. eminens;* but it has flowered and fruited this season in the Botanic Garden at Berkeley, and proves to be so distinct from other shrubby species of the genus that it is not easy to say to which one it is most nearly allied. Its only known habitat is Mt. Tamalpais, west of San Francisco Bay.

Lupinus Michenerii. Herbaceous perennial, or the very bases of the many stems woody-persistent during winter; branches rather slender, prostrate, 2 or 3 feet long, sparsely hirsute: petioles twice as long as the 7 to 9 leaflets, these somewhat fleshy; oblanceolate, acute, 1 inch long, the upper face deep green, clothed with scattered villous hairs, the lower face paler, and with a rather dense appressed pubescence: racemes subsessile; bracts short and inconspicuous: flowers rather small, in 4 to 6 distinct whorls; calyx green, but velvety-pubescent; banner notably smaller than the other petals, white throughout, but early changing to pink, and finally the whole corolla becoming lurid purplish-green: pods small, villous, few-seeded.

Grown for two seasons in the Botanic Garden at Berkeley, the living plant having been brought from Fort Bragg, Mendocino Co., California, in the spring of 1893, by Mr. C. Michener.

Delphinium Emiliæ. Slender, 2 feet high, from a strong cluster of thick woody-fibrous roots: stem retrorsely pubescent, some of the hairs hispid, others short and appressed: leaves on long villous-hispid petioles, the lamina cleft into about 5 segments which are broadly linear and entire below, but above the middle widened and doubly cleft, the ultimate divisions ovoid, acute: racemes about 3, slender-peduncled, rather loose: flowers small, dark blue: sepals obovoid, each with a strong apiculation which is abruptly incurved and covers a manifest round saccate depression; spur nearly straight, horizontally projecting or slightly ascending; upper petals glabrous, the lateral ones horizontally spreading over the stamens and very hirsute externally: follicles pubescent, the hairs incurved and appressed.

On hillsides in open grassy ground near the head of Knights Valley, Sonoma Co., California. Dedicated to my friend Mrs. Emily Gibbons Booth, of Berkeley, on the land of whose country home the type specimens were collected, June 15, 1894. The species is an æstival one, and in this respect akin to *D. hesperium*; but *D. variegatum*, though a vernal species, is a still nearer ally.

Eschscholtzia cucullata. Stout, very fleshy, depressed, the branches 1 to 3 feet long; the striæ of stem and petioles scabrous-serrulate: leaves compact and small, all the divisions broad, when young strongly cucullate-incurved, and even in age noticeably so: rim of torus very broad, revolute; calyptra ovoid, with an abrupt acumination fully as long as the body: petals 1 inch long, lemon-yellow with orange spot at base: pods stout, 3 inches long or more.

On the seacoast at Fort Bragg, Mendocino Co., California, Michener, 1893. The plant sent to the Botanic Garden by Mr. Michener has flowered for two seasons, and presents a strong contrast to other perennial species of the genus not only by its good specific characters, but also by a period of flowering quite its own, and two months later. It matures no seeds in the Berkeley climate.

Hemitomes pumilum. Whole plant a cushion-like subglobose body 1 or 2 inches high and nearly as broad, with a covering of very numerous closely imbricated thin scales, the outer being deltoid-ovate, the inner passing gradually to lanceolate, all acute, glabrous, or the inner with margins distinctly ciliate: flowers sessile at summit of the very short watery-fleshy stem, little exceeded by the inner bracts, and forming together a flat summit to the entire plant, the middle one of the cluster being 6-merous, all the others 4-merous: sepals 4, linear, ciliate: corolla very woolly within, its ovate lobes about as long as the tube, the whole organ pale pinkish: stamens not equalling the short stout style, hairy above the middle: stigma yellow.

Most remarkable species, the whole plant resembling a thistle head, or some similar object. The plant was found parasitic on roots of *Arbutus Menziesii*, by Mr. W. G. Wright, while exploring the forests of Mendocino County, California, in June of this year.

Stachys velutina. Stout perennial 2 to 6 feet high, clothed throughout with only a soft almost velvety, short pubescence, scarcely glandular and not very heavily scented: stem sharply quadrangular: leaves thickish, rugose, short-petioled, spreading, cordate-ovate, 3 to 6 inches long: spike terminal, interrupted, the bracts ovate-lanceolate: calyx with spreading mucronulate teeth or lobes: corolla small, white, with abundant red dots and lines; upper lip ascending, three-fourths the length of the lower, deeply concave and arched, concealing the stamens, lateral lobes of lower lip reflexed, half as large as the spreading concave middle lobe.

Brackish marshes about the bays of San Francisco and Suisun.

Stachys stricta. Perennial, rather slender, 2 to 4 feet high, only sparingly villous-hirsute, almost oily to the touch by abundant small resinous glands beneath the pubescence: leaves thinnish, ovate-lanceolate, ascending or suberect on their short petioles: bracts of the interrupted spike deltoid-ovate: calyx-teeth erect, or even somewhat connivent around the tube of the corolla: flowers small, white; upper lip of corolla short, erect, suborbicular, only slightly concave, not concealing the stamens, glandular-hairy externally; lower lip elongated and somewhat boat-shaped, the lateral lobes reduced to mere teeth and strongly deflexed.

Wet meadows in Knight's Valley, Sonoma County, California, June, 1894. Both this and the preceding are like *S. albens* in that they are coarse large plants of swampy places; but they are very distinct from that, and from each other, in aspect, pubescence, and especially in form of corolla, the characters of which have been neglected by authors.

ADDITIONS TO THE FLORA OF LOS ANGELES COUNTY AND CATALINA ISLAND.—II.

By Alfred James McClatchie.

Equisetum Mexicanum, Milde. A plant referred to this species by Prof. Underwood is quite abundant in the Arroyo Seco near Pasadena and in some of the cañons of Catalina Island. It is tall (2 to 5 feet high), weak, and inclined to branch considerably. The sterile stems and branches usually taper to a very slender tip.

Quercus Engelmanni, Greene. About Pasadena and Santa Anita, where, with *Q. agrifolia*, Née, it forms large groves. The spreading top is often from 75 to 125 feet in diameter.

Mollugo verticillata, Linn. Along railroad track in Los Angeles.

Polygala Californica, Nutt. (*P. cucullata*, Benth.). A slender shrub 4 to 7 feet high, growing at an altitude of about 3500 feet in the San Gabriel Mountains, is referred by Dr. Wheelock to this species. (Reported by Dr. Davidson[1] as *P. cornuta*, Kell., since the above was written).

Epilobium adenocaulon, Hausskn., var. *occidentale*, Trel. *E. holosericeum*, Trel. Cañons of Catalina Island.

Epilobium paniculatum, Nutt. Pasadena.

Œnothera alyssoides, H. & A. Pasadena; Echo Mountain.

Sanicula bipinnata, H. & A. Woods near Pasadena.

Sium heterophyllum, Greene. Stream near Pasadena.

Conium maculatum, Linn. Pasadena.

Caucalis nodosa, Huds. Pasadena.

Cornus pubescens, Nutt., var. *Californica*, C. & E. For the present, I refer here a shrub about 15 feet high, with a trunk between 3 and 4 inches in diameter, growing in one of the cañons of Catalina Island. The fruit is lead color, the stone nearly globose, and the pubescence only a few appressed hairs. It may prove to be worthy of a new varietal, or even specific name. It was first collected by Mr. Harry Polley in March, 1893.

Garrya Veatchii, Kell. Along Mt. San Antonio trail; Echo Mountain, where it has fruited abundantly the past two seasons. As Prof. Greene predicted, the fruit is found to be capsular.

Cycladenia humilis, Benth. Mt. San Antonio, 8000—9000 feet.

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[1] ERYTHEA ii., 84.

Veronica peregrina, Linn. Pasadena.

Sphacele fragrans, Greene. Middle Ranch Cañon, Catalina Island.

Galium trifidum, Linn. Baldwin's Ranch.

Galium grande, n. sp. Suffrutescent evergreen, the woody stems 3—5 lines in diameter, 3—8 feet long, erect or reclining on bushes; herbaceous branches 4—12 inches long, these and foliage cinereously hirsute or hispidulous; leaves in fours, elliptic-oblong or slightly broader above the middle, acute (sometimes abruptly so) or acuminate, margins somewhat revolute, 3—6 lines long, 1—2½ lines broad, lower side lighter green: flowers numerous, polygamous, commonly terminal, occasionally axillary, 1—5 on a peduncle, greenish-yellow, 1—2½ lines broad: ovary densely hirsute; mature fruit baccate, clothed with stiff hairs, at first nearly white, but soon changing to black, about 2 lines in diameter.—Collected at various dates from April, 1893, to April, 1894, in shaded soil at 2000—4000 feet elevation, along the old trail to Wilson's Peak. It blooms during April and May, and matures its fruit in August.

Galium occidentale, n. sp. Perennial, herbaceous, slender, from creeping rootstocks, 4—15 inches high, whole plant hirsute: leaves in fours, thin, flat, elliptical or ovate, acute or acuminate, 3—6 lines long, 1—3 lines broad: flowers few, polygamous, terminal, yellowish-white: ovary densely hirsute; mature fruit baccate, clothed with scattered hairs, pearly white, changing to black in drying, 1—1½ lines in diameter.—Collected at various dates from May, 1893, to April, 1894, at 3000—4000 feet elevation along the old Wilson trail. Blooms in May and matures its fruit in July. Both growing and withering stems are present at all times of the year.

Ericameria cuneata=*Aplopappus cuneatus*, Gray; **E. monactis**=*Aplopappus monactis*, Gray. Both in Rubio Cañon

Hazardia squarrosa (H. & A.), Greene. Catalina Island.

Aster adscendens, Lindl. Mt. Lowe, 4000—6000 feet; Mt. San Antonio, 5000—8000 feet.

Aster Fremonti, Gray, var. *Parishii*, Gray. Cañons of San Gabriel Mountains.

Erigeron Canadensis, Linn. *Conyza Coulteri*, Gray. *Pluchea camphorata* (Linn.), DC. Near Avalon, Catalina Island.

Gnaphalium Californicum, DC. Catalina Island. The most common species on the mainland.

Gnaphalium leucocephalum, Gray. Foothills of San Gabriel Mountains and adjacent plains.

Xanthium spinosum, Linn. Catalina Island.

Heleniastrum puberulum (DC.), O. Ktze. Near Avalon, Catalina Island.

Hypochœris radicata, Linn. Pasadena.

Sonchus oleraceus, Linn. Avalon, Catalina Island.

ERRATA IN PREVIOUS ISSUE.

Page 77, fifth line from bottom, for "Torr. Frem" read Torr. & Frem. Page 79, third line from top, for "A. nitens Greene" read A nitens (Nutt.), Greene; fifth line from top, for "Papapaver" read Papaver. Page 80, last line of first par., for "fruiting" read fruit ripe.

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CONTENTS:

PAGE
New Californian Uredineæ—II., - - - - - *P. Dietel* 127
Chapters in the History of Hepaticology—I., *Marshall A. Howe* 130
Transcripts of Some Descriptions of Californian Genera and Species—I., - - - *J. Burtt Davy* 136
Miscellaneous Notes and News, - - - - - - 141

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CHAPTERS IN THE EARLY HISTORY OF HEPATICOLOGY.—II.

By Marshall A. Howe.

In his "Commentarii de Historia Stirpium,"[1] Fuchs gives a little more than a page to the treatment of "Lichen." In its general trend, this is much like the discussion of Brunfels, so that there is no occasion for reproducing it. A slight advance is made, however, in that the caulicles are said to bear *stellate capitula,* and the accompanying figure shows *Marchantia polymorpha* with numerous carpocephala. The form spoken of, he says, is collected in the month of July.

At about this time, Jerome Bock carries the description of Marchantia a little further.[2] In a paragraph[3] on "Hepatica fontana seu Lichen" are words which may be translated thus: 'Lichen is a plant unfriendly to the summer sun, which delights in shady and likewise moist places and therefore grows only about the deeper and colder springs and on dewy rocks; it consists of a copious leaf, full of juice [the parts] pressed together like scales and cohering. The plant creeps here and there not differently from the way in which the lichen or *impetigo* spreads itself far and wide upon the skin. The root of the Lichen is nothing other than a very fine, soft, matted wool, by which it clings to the rocks; if you tear the herb away, it is plainly observed to be green on one side, and furnished with a many-parted, thick leaf, while, on the other, that by which it is joined to the rock, it is seen to be covered over in the manner of a plaster. As the month of May approaches, above the greater of those parts which we have spoken of as leaves, there arise certain other very small leaflets, similar to those of the *muscus palustris,* which raise themselves into

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[1] Page 462 in edition seen (Lyons, 1551). Original edition was published at Basel in 1542.

[2] Hieronymus Tragus, De Stirpium Historia; Latin version by David Kyber; Strasburg, 1552.

[3] Op. cit., p. 522.

Erythea, Vol. II., No. 9, [1 Sept., 1894.]

trees in better soil near the coast were devoid of fastened cones, and their long outstretched limbs or depressed, stratified heads, recalled the famous Cypress of Monterey.

PINUS CONTORTA, Dougl. Belonging naturally to boreal and littoral regions, this pine battles for and holds long stretches of northern beaches and scores of promontories until, meeting with a stronger tree (or it may be a truer expression to say it is overcome by the rising temperature of a southern clime), it comes to a halt on the coast of Mendocino. But these southernmost trees are the most robust of their species. Rioting in the rich loam near the mouth of the Noyo River and northward, are trees two to five feet in diameter and fifty to eighty feet high, with deeply rimose bark, two inches thick. The majority, however, creeping too near the sea, are beaten prostrate by the ocean storms and become low, close-set, scrubby trees, with masses of branchlets laden with large and dark green, persistent leaves and numerous elongated cones, the whole forming breastworks, or wind-breaks, behind which hosts of tender plants flaunt their profusion of flowers in saucy proximity to the ocean.

So perfect a protection against the rigors of winter are these masses of pines that the dairymen at Fort Bragg, twelve miles north of Mendocino, have cut roadways down into them and erected feeding racks for hay, and there peacefully ruminate the drowsy kine, nearly as well sheltered as if in State of Maine barns.

We have seen how this pine will battle for life on a slim diet that starves it to a pigmy on the barrens. The inherent, normal strength of a line of development is never more in evidence than when exhibiting ability to conform to conditions and preserve its integrity, though necessitated the while to change its features (until almost past recognition) to achieve success. So the constitution of this pine enables it to leave its favored home and penetrate the interior, for it is found in the sphagnum swamps and around the tide pools of Puget Sound, and also inhabits the gravelly plains of Oregon and Washington where even the lion-hearted Douglas Spruce does not penetrate. Crossing the interior valleys it is again encountered on the slopes of the Cascade Mountains, at elevations of 3,000 to 4,000 feet, near Mounts Hood and Adams (Lemmon, Johnson, Lloyd), and nearly as high in the vicinity of Mount Tacoma (Yelm Prairie; Piper, Muir, Von Trump).

With this species of pine may be compared the Western Yellow Pine, *Pinus ponderosa,* Dougl., and the Douglas Spruce, *Pseudotsuga taxifolia,* Britton, both having a wide range and often found in company from British Columbia to Mexico and both taking on half a dozen forms to meet new conditions and escape extinction.

VARIETIES OF PINUS CONTORTA, Dougl. Early botanists included the sub-alpine "Tamarack Pine" of the Sierra and Rocky Mountains with this normally coast species, and such reference led to the misconception that *P. contorta* has very thin bark of a light color, whereas it everywhere has comparatively thick bark and, near the sea, it attains a thickness of two to three inches and is black and deeply rimose. The Tamarack Pine, loving high wet valleys and stream-banks, is usually a slim, tall tree, four to seven feet in diameter, with exceedingly thin, scaly bark (resembling eastern Larch), not more than one-sixteenth to one-fourth of an inch thick on the largest trees. The heart-wood closely resembles that of White Pine, soft and white or light yellow from which the thin sap-wood differs but little in color. Added to all these important particulars, the cones are ovate-elliptical, one and one-half to two and one-half inches long, tardily dehiscent at maturity, and the leaves, in pairs, are much larger than any variety of *P. contorta,* about two lines wide, and two to three inches long. In *P. Murrayana* the seeds are brown, unmottled, one and one-half to two lines long; the wings are translucent, five to eight lines long, widest a little below the middle. *P. contorta* has light brown seeds, mottled on the upper side with dark spots. They are ovate, one to one and one-half lines long, wings nearly transparent, three and one-half to five lines long, widest near the base. These points of difference abundantly justify Prof. Balfour's judgment in raising this form of pine to the rank of a species, dedicating it to the discoverer as *Pinus Murrayana.*

The true *Pinus contorta,* divested thus of its near relative, consists mostly of the form on the coast of which some characters have been given, but others must now be stated. The leaves and cones exhibit an unprecedented disposition to sport or vary in many directions, this variability seems to have no relation to location or condition, widely different leaves and cones being found not only upon trees of the same grove, but upon limbs of the same tree. The leaves vary widely (especially on Alaskan trees) while the cones on certain trees, or on certain limbs, are two and one-half to three inches long and an inch wide near the base; on other trees or other limbs they are but an inch long; but whatever the size there is another point of variability, prevalent in the development of the scales. Normally, they are nearly flat, with low apophyses and short slender prickles (as originally described by Loudon), but often the cones are conspicuously tuberculated, the basal scales on the exterior side being specially developed with conical apophyses and strong prickles. Often these specialized scales extend all along the outer side of the cone, and again, they may occur only at the apex. Upon trees of the interior regions this variation is unknown, all the cones are nearly uniform in size and all have slightly elevated scales on the exterior base.

Var. **Bolanderi.** The little dwarfs on the Mendocino Plains described, though similar to the typical form, are still quite peculiar in respect of small size in all their parts, besides in the general form of the trees, being conical instead of round-headed, and the color of the foliage being lighter, and the bark thinner. This strongly marked variety may well bear the name of its discoverer, H. N. Bolander.

Var. **Hendersoni.** In "Zoe," ii, 287 (Oct. 1891), Professor L. F. Henderson writes of a "black pine" met with on a burnt plain near Union City, Mason Co., Washington: "Then came quantities of the black pine (*Pinus contorta*), which differs here as it does in the high mountains, from the ordinary seacoast form, possibly enough to merit the specific name some give it of *P. Murrayana.* It struck me as I looked at this tree that it took just the intermediate ground between the coast and high mountain forms and made even the var. *Murrayana* of Engelmann unnecessary. The coast tree is a low, bunchy tree, thickly covered with very enduring cones; the mountain tree is a very tall tree for its size, at times more resembling gigantic bamboos than trees. This form occupied the middle ground. It is never very bunchy, but bears cones, as does the coast form when quite low. As I rode along, the cones on the tops of some of these trees or bushes did not reach my shoulder. Here it is always symmetrical and at times reaches goodly proportions. * * * Between Union City and Shelton I observed many [trunks] over two feet in diameter, and one old decrepit hero, broken off half-way up, measured nearly three feet."

Mr. C. V. Piper, writing of this western Washington pine, states, "The old trees that had not been burned were thirty to sixty feet high, twelve to eighteen inches in diameter, bark dark-grayish, an inch and more thick, broken by longitudinal and transverse fissures into small, pyramidal blocks, like the bark of *Quercus Garryana.*" Mr. Piper, it may be noted, considers this pine different from *P. contorta.*

The leaves of this variety are slender, about two-thirds of a line in width and two to three inches long; the cones are less elongated than those of the coast form and less persistent.

This variety may include all the forms of the interior alluded to, but should never be confounded with the amply distinct *P. Murrayana.*

CALIFORNIAN FIELD NOTES.—V.

By Anstruther Davidson, M. D.

The Cruciferæ of Los Angeles County.

The native plants of this order are numerically, at least, well represented in this county, no less than thirty-four having been collected by the writer. Of this number about one-half are recorded in the Botany of the State Survey, as existing in the district or common to the Coast Range. The others since discovered show in many instances a marked extension of their supposed natural range, in part due to more accurate exploration and in part, perhaps, to the inherent virility or power of adaptation to changed conditions of soil and climate so characteristic of this order of plants.

The following appear worthy of record :

Cardamine integrifolia, Greene. In wet grounds in the Laurel and other cañons of the Coast Range.

Arabis Holbœllii, Hornem. Extending from the San Bernardino Mountains to the foot-hills of the Sierra Madre. Flowers very variable but the petals seldom three lines long.

Arabis pulchra, Jones. Frequent on the Mohave Desert and surrounding mountains.

Streptanthus heterophyllus, Nutt. Not uncommon in the foot hills around Los Angeles.

Streptanthus longirostris, Wats. A desert species common at Lancaster; a few plants grow at Rubio Cañon near Pasadena.

Streptanthus inflatus, Greene. Localized in low-lying soils on the Mohave.

Thelypodium integrifolium, Endl. Somewhat rare at Lancaster.

Thelypodium procerum, Greene. On the desert slope of the Sierra Madre Mountains.

Caulanthus amplexicaulis, Wats. Foot-hills of the Mohave Desert; sparingly at San Fernando.

Sisymbrium incisum, Engelm., var. *filipes,* Gray. In saline soils of the higher mountains.

Nasturtium curvisiliqua, Nutt., var. *lyratum,* Wats. At Garvanza and Santa Monica ; very rare.

Lepidium latipes, Hook. In saline soils near Santa Monica.

Lepidium dictyotum, Gray. Near Santa Monica.

Lepidium dictyotum, Gray, var. *acutidens*, Gray. Common on the desert near Lancaster. In some of the specimens, the stigma was quite prominent.

Lepidium nitidum, Nutt. The southern type of this species is one of the common weeds of early spring, and when robust is hirsutulous, not only on the branches, but also on the midrib and edges of the leaves. The petals are always present and the flowers are all fertile; the stamens sometimes apparently two through union of the filaments. A few plants of what I presume is the northern form I found by a roadside near the city, though growing luxuriantly, they were more glabrous than the native species: the petals were absent, the pod had a narrower cleft, and the pedicels were more decurved.

Lepidium lasiocarpum, Nutt. Azusa.

Lepidium flavum, Torr. On the Mohave in alkaline soil.

Lepidium Fremonti, Wats. With the last. Only the upper leaves are linear; the lower are pinnatifid with linear lobes.

Thysanocarpus curvipes, Hook., var. *pulchellus*, Greene. The common Lacepod of this section.

Biscutella Californica, B. & H. Growing sparingly near near Lancaster. The petals of the desert plants are of a dull white color.

Biscutella Californica, B. & H. var. **maritima**, n. var. More hoary-tomentose than the type: leaves thick, fleshy, sinuate; the radical oblong, broad at base; cauline very broadly cuneate and never quite sessile; racemes dense, elongating in fruit; flowers usually over a half-inch long, limb purple in the bud becoming lighter; pedicels very dark purple; fruit as in the type. Found growing in the sand on the sea shore at Redondo by Miss A. J. Merritt.

Tropidocarpum dubium, n. sp. Decumbent, the many branches 6 to 12 inches long, roughish pubescent; radical leaves regularly pinnatifid, with tricuspidate segments, 2 to 3 inches long with petioles one-third their length, cauline leaves sessile with linear segments; sepals 1 or 2 lines long, obtuse; petals yellow, twice the length of the sepals; stamens tetradynamous (but not markedly unequal), slightly exceeding the short pistil; silique puberulent, ½ to 1½ inches long, a line wide, nearly diamond-shaped in cross-section, one-celled below, the upper ⅓ or ¼ obcompressed, two-celled, the valves dehiscent leaving the placentae supporting the narrow but at the apex complete partition; seeds in two rows occupying the whole length of the pod; pedicels slightly arcuate, varying from ¼ to 1 inch in length. The common and only species of *Tropidocarpum* found in the immediate neighborhood of Los Angeles.

In the Botany of the State Survey, *Tropidocarpum, gracile* and *T. scabriusculum* are considered as synonymous. Professor Greene in the Flora Franciscana treats the latter as a variety, but no detailed account of the fruit is given. From the description, however, I think *T. scabriusculum* is the common species of this district outside of Los Angeles. Those I have seen at San Bernardino, Newhall, and the Mohave desert all seem to belong to it.

All three species resemble each other in the form of the leaf, color of the foliage, and in some other particulars, but all differ strikingly in fruit. In *T. gracile* the pod is smooth and indehiscent. In *T. scabriusculum*, as I understand it, and in *T. dubium*, it is, so far as I have observed, always dehiscent. In *T. scabriusculum* the pod is obcompressed throughout its whole length, two celled, the partition though narrow, is complete from end to end. The pubescence on the pod is very apparent in this, only microscopically so in *T. dubium*. The pedicels in *T. scabriusculum* are straight and always less than a quarter of an inch long; in *T. dubium* they are arcuate and always longer.

NOVITATES OCCIDENTALES.—VIII.

By Edward L. Greene.

Trifolium Monoense. Low cespitose perennial of the *Lupinaster* group : stem, of many branches clothed with persistent stipules of former seasons, almost subterranean and caudex-like : petioles slender ; leaflets 4 to 6, pale green, sparsely appressed-villous, narrowly oblong-cuneiform, nearly entire, cuspidately mucronate : peduncles slender, far surpassing the leaves ; heads hemispherical, ¾ inch broad ; calyx very densely villous, the setaceous teeth longer than the short-cylindraceous tube.

In the White Mountains, Mono Co., California, Shockley, n. 460, collected 22 July, 1886. Species distributed as a variety of *T. Andersonii*, though as nearly related to *T. andinum* as to any ; but that has three leaflets only, and heads sessile between a pair of leaves.

Trifolium productum. Slender and rather tall, 1 to 1½ feet high, glabrous, pale and glaucescent, sparingly leafy : lowest leaflets from oval to oblong, seldom obtuse, those of the stem 1 to 1½ inches long, ovate-lanceolate, acuminate, lacerately serrate : heads mostly solitary and terminal, semi-ovate or obconical by deflection of the pedicels, the rachis produced strongly beyond the flowers and terminally cleft into several uncinate branches, the whole resembling a grappling hook.

Common in the higher Californian Sierra, from about Mount Shasta southward to Placer County. It has been referred sometimes to *T. Kingii*, sometimes to *T. Bolanderi*, but is easily distinguished from both, and has a geographical range all its own. *T. Bolanderi* is a rare, and probably quite local plant, and has not, to my knowledge, been collected except by Bolander himself. It is a low slender flaccid cespitose plant of deep green hue, with short obcordate leaflets, and very slender scapiform peduncles, each bearing a few-flowered umbel, the flowers being much smaller than in the present plant.

Trifolium pinetorum. Allied to *T. involucratum*, but strictly annual, with many nearly or quite prostrate branches a foot long or more, with long internodes and not at all flexuous: petioles ½ to 1 inch long; lowest leaflets only ¼ inch long, obcordate, those of the middle of the stem oblong-obovate, obtuse, the uppermost 1 inch long or more and from somewhat rhombic-oblanceolate to obovate-oblong, denticulate to spinulose-serrulate: peduncles much exceeding the leaves; heads ½ inch broad at flowering, ⅝ inch in fruit; involucre small, parted to the base into a number of subulate setaceous-pointed divisions: calyx-tube campanulate, 10-nerved, 1 to 1½ lines long, the teeth fully 3 lines long, slenderly aristiform, from a triangular-subulate base: corolla little surpassing the calyx-teeth, whitish or flesh-color, but the wings almost black at the tip.

Common on gravelly banks or dry stony beds of streams in the region of pine forests among the mountains of southern New Mexico, adjacent Arizona and Mexico, and the only clover of that district; very peculiar in its habitat, abundantly distinct from *T. involucratum* (under which name I distributed it), always annual, flowering in autumn.

Trifolium lacerum. Of the involucrate series, near *T. variegatum* and annual: branches decumbent or nearly prostrate, slender, very flexuous and the internodes short: petioles scarcely ½ inch long; leaflets 1 inch long, linear-lanceolate, cuspidately acute, fimbriate-lacerate: peduncles short, though exceeding the leaves: heads barely ½ inch broad; involucre small, lacerately cleft: tube of the calyx 1 line long, campanulate, 10-veined, with no transverse veinlets; teeth 2½ lines long, subulate below the middle, thence tapering to a long aristiform tip: corolla red-purple, surpassing the calyx.

In springy places, "Valley of the Sierra de Las Animas," in southern Colorado or northern New Mexico, Charles Wright, n. 997. Species referred to *T. involucratum* in the *Plantæ Wrightianæ*, which was not a good guess, as the plant is certainly annual, and nearer *T. variegatum*, though easily distinct from that also.

Delphinium Burkei. Stems one or several, a foot high or more, erect, not slender, from a manifestly woody-fibrous root, leafy at or near the base only : foliage and lower part of stem seeming glabrous, though somewhat puberulent under a lens ; upper part of stem and the inflorescence clothed with a short villous-hirsute pubescence : leaves 2 inches broad, deeply parted into many linear and oblong-linear obtusish segments, the texture rather fleshy : raceme rather long and narrow, the pedicels being equal and quite erect : sepals deep blue, pubescent exteriorly, spur rather long, usually blunt, nearly straight and horizontal ; petals conspicuously white, or perhaps ochroleucous : ovaries densely appressed-villous : follicles unknown.

Plant of Burke's collection, from the "Snake Country," probably in the State of Idaho; the specimens referred by Asa Gray to his *D. Andersonii*, perhaps for an assumed geographical reason, for the two species are not near of kin ; and the Snake River Country is exceedingly unlike the region which *D. Andersonii* inhabits, of which fact Dr. Gray was unaware.

Delphinium camporum. Root a fascicle of few coarse rather fleshy fibres : stem stout, very erect, seldom more than a foot high, remarkably velvety-pubescent from the base up to the inflorescence : leaves mostly near the base of the stem and numerous, many-cleft into linear lobes, and pale with a fine appressed pubescence : raceme long, strict, simple and usually dense, the pedicels short, very erect, even applied to the rachis throughout : flowers white, or with a tinge of flesh-color : spur erect, either parallel with the rachis or curving slightly away from it : petals rather heavily pilose.

A plant of dry sandy plains along the eastern base of the whole Rocky Mountain Range, apparently from British America to Mexico ; one of the most distinct and strongly marked species of Larkspur in the whole North American flora, yet hitherto unrecognized as a species. I have known it well for about twenty years, but have been unwilling to think that a plant of such pronounced characters had escaped a specific name and diagnosis ; though its habitat is peculiar, and it is nowhere common. While other members of the genus on western plains or hills occur plentifully in their localities, and even sometimes form masses, this one—and it is the only species found on the low dry plains—is so scarce that one may botanize for a whole day in the very center of its distribution without seeing three plants of it; yet it has a meridian range of probably twelve or fifteen hundred miles. I have an impression that I have seen it in southern Arizona to the westward of the dividing ridge of the continent; but otherwise it belongs to the plains of New Mexico, Colorado, Wyoming, etc. Geyer's n. 329, from the "Black Snake Hill"—probably somewhere in Wyoming—though too tall a plant, with foliage too much scattered, yet unmistakably of this species, though not the best natural type of it, bears in the herbarium of Hooker this legend: "*D. azureum*, var. E, T. & G." The handwriting is not recognizable as that of either Torrey or Gray; but it may be assumed to be authentic for connecting this plant with that paragraph of the old Flora; and the authors had their specimen from "Lake Winnipeg," collected by Houghton. The species is easily recognizable, even in the herbarium, by its marked habit, stout velvety stem, white flowers, and above all, the peculiarly erect spur. This organ, in all other species known to me, projects backward more or less horizontally, crossing the rachis of the raceme at some kind of an angle; but here it is parallel with the rachis, or else curves away from it in such wise that the tip of the spur somewhat overarches the expanded part of the flower. In most larkspurs white-flowered plants are mere albinos; but in the case of this species the flowers have never even a tinge of blue.

Delphinium tenuisectum. Root thick, subligneous and perpendicular, the fibrous parts, if any, not shown: stem rigid, stoutish, strongly angled and distinctly striate between the angles, 2 or 3 feet high, the whole plant rather obscurely puberulent: leaves mostly cauline and quite numerous, very short-petioled, finely cut into very many narrowly linear segments: raceme a foot long; flowers rather large, intense blue, on short ascending pedicels ; spur slender-conical, *i. e.*, short and stout, ascending or nearly horizontal ; lateral petals moderately woolly-hirsute : follicles large, erect, puberulent, cuspidately acute.

A Mexican species, the type being Pringle's n. 1184 from Chihuahua, 27 Sept. 1887. Gray's *D. scopulorum*—the real type of it—is the nearest relative of the present species, which, however, is remarkably distinct by its finely dissected foliage, this almost approaching that of Old World larkspurs of the *Consolida* group.

TRANSCRIPTS OF SOME DESCRIPTIONS OF CALIFORNIAN GENERA AND SPECIES.—IV.

By J. Burtt Davy.

Index seminum horti Academici Gotting. 1837. 4to.[51]

Lepidostephanus madioides, Bartl.[52] char. gen. (ad Compositas Madieas pertinet). Capitulum multiflorum radiatum, ligulis femin. 3—5 abbreviatis tridentatis, fl. disci tubulosis hermaphr. Involucrum biseriale, foliolis exterioribus achaenia radii involventibus, interioribus planis submembranaceis. Recept. nudum. Achaenia lineari-obovata, compressa, 10-costata, radii glabra pappo minuto annulari, disci scabra, pappo biseriali, serie utraque e paleis 5 membranaceis oblongis unguiculatis, interna corollam et involucrum aequante, externa duplo breviori.— Herba annua diffusa subvillosa, foliis sparsis linearibus semiamplexicaulibus integris (2—3-poll. long.) Capitula terminalia solitaria pedunculata oblonga semiunciam longa. Involucri foliola lineari-oblonga. Ligulae initio flavae demum fuscae, parum ex

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[51] Extracts reprinted from *Linnæa* xii, Litteratur-Bericht pp. 80-83 (1838).

[52] *Bartling, Ind. Sem. Hort. Goett.* 1837, p. 4; *Linnæa* xii, Litt.-Bericht, p. 82 (1838):=*Achyrachaena mollis, Schauer.*

involucro emergentes. Pappi paleae nitidissimae ad lentem fimbriato-ciliolatae. Semina in California leg. b. Douglas.

Delectus seminum in horto botan. Vratislaviensi[53] *collectorum 1837*. 4to.[54]

1. Achyrachæna n. g.[55] *Capitulum* multiflorum heterogamum; floribus radii 5—10, uniserialibus, foemineis, ligulatis: ligula brevi tridentata; floribus disci hermaphroditis, tubulosis, 5-dentatis. *Involucrum* oblongum; squamis uniserialibus tot quot ligulis, dorso convexis, marginibus involuto-complicatis achaenia radii omnino involventibus. *Receptaculum* planum, paleas inter radium et discum biseriales (subfoliaceas involucri seriem alteram mentientes) gerens, alveolatum: alveolis circum margines villosis, centro fimbrilliferis. *Styli* florum hermaphroditorum rami inferne ad latus internum series 2 stigmatico-glandulosas gerentes, apice acutiusculo terminati. *Achaenia* subrecta, fusiformia, in basin valde attenuata (ut fere obrostellata ea diceres) 10-costata; areola baseos cupuliformis callosa achaenia hac ex parte paulo latior; stipes seu pedicellus brevis, filiformis areola illa callosa terminali; *radialia* breviora obsoletius costata (costis hinc inde tantummodo scabris, transverse ruguloso-granulatis) pappo ad annulum reducto calva; *discoidalia* longiora, muricibus copiosis undique, praecipue vero in costis scaberrima, pappo paleaceo biseriali coronata. *Pappi* laminae latiusculae, scariosae (candidae, extus sub lente scabriusculae); exteriores 5 (duplo) breviores quam 5 interiores (flores aequantes, lineares apice obtuso fimbriolatae). — Genus inter *Euhelenieas* (pappo) et *Madieas* (involucri achaeniorumque marginalium conditione) intermedium quasi, posteriori divisioni, qualem exhibuit cl. *Candollius*, adnumerandum.

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[53] Breslau.

[54] Extracts reprinted from *Linnæa* xii, Litteratur-Bericht, pp. 87-89 (1838).

[55] Schauer. *Del. Sem. Hort. Vratislav.* 1837. 3; *Linnæa* xii, Litt.-Bericht, p. 87 (1838).

ACH. MOLLIS, n. sp.[56] Herba annua, adscendens, tota villo molli simplici induta, crebris inmixtis pilis glanduliferis sed oculo nudo vix perceptibilibus, ramosa, ramis superioribus alternis elongatis in pedunculos longos monocephalos desinentibus sub capitulo parum ampliatos. Folia basi lata sessilia, linearia, breviter acuminata, inferiora margine dente uno alterove aucta. Capitula 20—30-flora, oblonga, pollicis longitudinem fere metientia.

Semina accepimus adscripta patria California. Floret aestate. *C. Schauer.*

---

[56] Schauer, op. cit. p. 88: synonym, *Lepidostephanus madioides*, Bartl.

In the year subsequent to the publication of these two names, Monsieur A.P. DeCandolle re-described *Achyrachaena mollis* in the Prodromus, from dried specimens communicated by the Royal Horticultural Society of London, but for some unaccountable reason, he altogether ignored *Lepidostephanus madioides* as well as another of Prof. Bartling's species published at the same time and place. This can scarcely have been from oversight as *Tagetes signata*, a third species described by Bartling in the same Index, is duly included in the *mantissa* at the end of vol. vii of the Prodromus.

In the 1840 *Ind. Sem. Hort. Goetting*, Bartling announced the discovery that Schauer's *Achyrachaena mollis* and his own *Lepidostephanus madioides* were identical, he therefore reduced the name *Achyrachaena* to the rank of a synonym.

Endlicher included both genera in his *Genera Plantarum* (1836-40) placing *Achyrachaena* between *Leptopoda* and *Gutierrezia* of the Heleniææ—Gaillardieæ; and *Lepidostephanus* between *Madaroglossa* and *Calycadenia* of the Madieæ. In the second *Supplementum* (1842) he followed Bartling in treating *Achyrachaena* as a synonym.

Among subsequent authors we find Torrey & Gray (1842) Walper (1847) Bentham & Hooker (1873) and Asa Gray in the *Synoptical Flora* (1884) maintaining *Achyrachaena* instead of *Lepidostephanus* and treating the latter as a synonym,—why, we cannot tell unless it be because the former name occurs in the *Prodromus*.

In the *Nomenclator Botanicus* (1874) Dr. Pfeiffer follows Bartling and Endlicher in maintaining the name *Lepidostephanus* in preference to that of *Achyrachaena*.

Without means of reference to the original *Index*, and failing to find any collateral evidence as to priority, I am not able to determine which name is the elder. This uncertainty leaves one free from the unpleasant obligation to change a long familiar name, for the sake of priority.

MISCELLANEOUS NOTES AND NEWS.

THE FORMAL organization of the Botanical Society of America was completed at Brooklyn, N. Y., August 15, 1894, by the adoption of a constitution and the election of officers. The constitution limits active membership to American botanists "engaged in research, who have published works of recognized merit." Candidates for such membership must be recommended by three members of the Society not members of the council. The council is composed of the officers of the Society, of the last past President and of two members elected by the Society. The officers are as follows: President, Wm. Trelease; Vice-President, N. L. Britton; Treasurer, John-Donnell Smith; Secretary, Chas. R. Barnes; elective members of council, C. S. Sargent and E. L. Greene.

A REPORT on "The Uncultivated Bast Fibres" is one of the latest contributions from the U. S. Department of Agriculture. Various native species such as *Sesbania macrocarpa*, *Hibiscus moscheutos*, *Urena lobata*, *Asclepias incarnata* have been investigated. The history of cultivation of the plants and of experiments with the fibres is considered in connection with related foreign species of commercial value.

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UNIVERSITY OF CALIFORNIA.

CONTENTS:

PAGE
Novitates Occidentales—IX., - - - - *Edw. L. Greene* 189
Corrections in Nomenclature—V., - - - - *Edw. L. Greene* 192
Traditional Interpretation of Linnean Nomenclature, - - - - - - - - *Dr. Saint-Lager* 194
Miscellaneous Notes and News, - - - - - - - 201

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NOVITATES OCCIDENTALES.—IX.

By Edward L. Greene.

Ranunculus hesperoxys. Herbage deep green, glabrate, only the young and growing parts villous-canescent: stem erect, 1½ feet high, freely branching and many-flowered: leaves nearly all in a radical tuft, petiolate, of firm texture and rounded outline, deeply parted and subdivided into many somewhat lanceolate acute segments: petals round-obovate, usually 5 only: achenes large, flat, with short triangular-subulate hooked beak.

This is the plant which, in the *Flora Franciscana* and in the *Manual*, I called *R. canus*, for the reason that it seemed to come nearer the description of that species than any other plant known to occur in the region whence Mr. Bentham had his type. But having now seen that type, I am prepared to assert that *R. canus* has not yet been rediscovered. Nothing at all resembling Hartweg's plant is known to Californian botanists of the present time.

Ranunculus Harveyi. *R. abortivus*, var. *Harveyi*, Gray, Proc. Am. Acad. xxi. 372. The mention of the large showy flowers of this plant, as constituting the only difference between it and *R. abortivus*, is a very imperfect and misleading account to give to it. The achenes are much larger, and not half as numerous as in *R. abortivus;* moreover they form an exactly globose head, whereas those of *R. abortivus* proper form an ovoid one. But the vegetative characters of *R. Harveyi* are perhaps more than equally pronounced. As to stem and foliage it is slender and of delicate texture, while its roots are thick and fleshy to a degree almost approaching the tuberous. The roots of *R. abortivus* are merely coarse-fibrous.

Delphinium Geyeri. Root woody-fibrous: stem stoutish, 10 to 20 inches high: leaves mostly near the base of the stem and forming a considerable tuft, but in taller specimens

Erythea, Vol. II., No. 12, [1 December, 1894.]

many cauline also, these diminishing upwards; the whole plant, especially the calyx, pedicels, and upper part of stem, canescently tomentulose: leaves slightly fleshy, cut into many linear segments, each of these tipped with a white callosity: flowers rather large, very deep azure, in a narrow simple and strict raceme; spur stoutish, horizontal or ascending, curving downwards from near the tip.

Common plant of the very high plains toward the headwaters of the Platte River in Wyoming and northern Colorado. First collected by Nuttall, whose specimen (Herb. Brit. Mus.) is ticketed "*D. bicolor?* collected in Rocky Mts. by myself," though it is far enough from being his *D. bicolor*. It is also Geyer's n. 163 of "Slopes of undulating plains between the Kansas and Platte rivers, with *Œnothera serrulata.*" It is one of several easily distinguishable plants, from widely sundered, and very different climatic regions, which Dr. Gray referred to *D. azureum.*

Phacelia leptostachya. Annual, stout, widely branching from the base and decumbent, the branches often 2 feet long or more, sparsely pilose-hispid with spreading brownish hairs, and slightly glandular-viscidulous: leaves ample, the lowest tripinnately dissected: spike-like racemes neither clustered terminally nor in pairs, but usually solitary and placed at intervals up and down the whole plant, in fruit commonly 6 inches long or more: calyx hispid, and with a shorter, denser, hirsute pubescence beneath; sepals spatulate, one of them conspicuously longer, and twice as wide at the tip as the others: corolla small, broadly funnelform with short rotate limb, little surpassing the calyx, and of a dingy greenish white: stamens conspicuously exserted, seeds 4, light brown, rugose-muricate.

A number of years ago, knowing this plant well, and not finding it recognized by any botanical author, I sent it to Asa Gray as a new species. Up to that time he had himself overlooked altogether Bentham's *P. distans*, and wrote me at once that this was the long forgotten species of Bentham. On this authority I described this plant in my *Manual* as

P. distans, Benth. But my counsellor had been misled. It is not that species, as an examination of Bentham's specimens has shown me; nor is it even what Gray himself sent out as representing *P. distans* after he had come to recognize that species. True *P. distans* is one of the commonest and most widely dispersed of Californian Phacelias. Nuttall collected it at San Diego, and had it named as new in his herbarium, *i. e.* "*P. floribunda.*" The bulk of the specimens extant in herbaria will probably be found bearing the name *P. tanacetifolia*, with which much less common species it has been confused; though I had remarked its manifest peculiarities long ago. Its stem is more densely, and quite retrorsely hispid. Its spikes are short, and collected at and near the ends of the many branches in pairs or several together. Its corolla is very broad and open, and of a lavender color. Its calyx is less unequal than that of *P. leptostachya.* The new species is abundant in sandy soil, under oak trees, and even along the less frequented and newer streets of Alameda, California; a station that yields a goodly number of well marked and very local species in other genera. A marked variety of it, or possibly a distinct species, with larger and almost white corollas, the whole plant smaller, and the spikes less scattered, is common on sandy or rocky hills at San Francisco, and in Marin and Sonoma counties.

Phacelia umbrosa. Allied to the preceding, but only sparingly hispidulous and not viscid or glandular, very slender, amply leafy throughout: foliage thin, the segments not deeply cut, scarcely more than crenate-toothed: sepals as unequal, but thinner, ampler and longer: corolla with much longer and narrower tube and smaller limb, bluish-lilac, or pale violet: stamens not exserted.

Northern part of the peninsula of Lower California, C. R. Orcutt, 1885.

Amsinckia microcarpa. Erect, a foot high or more, rather slender, sparingly hispidulous: cauline leaves broadly lanceolate: racemes not bracted, short and rather dense:

calyx very small, the sepals not accrescent, only a line long at maturity, whitish-villous below, with a few coarse short rufous hairs at tip: corolla quite large, ½ inch long, with rather ample spreading limb: nutlets only ⅓ line long, ovate, somewhat incurved, very sharply rugose transversely, with no dorsal ridge.

Plant collected long ago by Dr. Coulter, probably in the southern part of California, but possibly in Mexico. Calyx and nutlets very characteristic.

Amsinckia barbata. Stout and coarse, erect or decumbent, the branches loosely floriferous throughout, all except the uppermost pedicels subtended each by a broad ovate-lanceolate amplexicaul foliaceous bract: sepals 4 or 5 lines long, nearly linear, without rufous or fulvous pubescence, but densely white-hirsute along the margins, sparsely hispid with whitish bristles on the back: corolla small: nutlets ovate-acuminate, closely muricate-tuberculate, without transverse rugosities, but with an elevated and toothed dorsal ridge.

Cameron Lake, Vancouver Island, 15 July, 1887, John Macoun. Type specimen in the herbarium of the British Museum. Species somewhat related to *A. tessellata*, but remarkable for its great leafiness throughout; the pubescence of the calyx most peculiar; the rather soft white beard of the margins of the sepals concealing the fruit.

CORRECTIONS IN NOMENCLATURE.—V.

By Edward L. Greene.

Ranunculus Drummondii. *R. Hookeri*, Regel, Pl. Radd i. 47 (1861); A. Gray, Proc. Am. Acad. xxiii. 369, not of Schlechtendal, Linnæa, ix. 610 (1835). The central Mexican plant so long ago named *R. Hookeri*, and fully described by Schlechtendal, is no very near relative of *R. repens*, but a thoroughly valid species; this notwithstanding that some other Mexican plants commonly referred to this by recent botanists seem to demand separation from it.

Kumlienia Cooleyæ. *Ranunculus Cooleyæ*, Rose, Contr. U. S. Herb. i. 289, t. 22 (1893). If the figure of the flower be correct, this species has both calyx and corolla much more like those of *Ranunculus* than has the typical *Kumlienia*. In that we have the calyx of *Caltha* and the corolla of *Helleborus;* but even in this second species the petals are represented as differing much from those of *Ranunculus* as to the nectariferous part. The carpels are genuinely those of *Kumlienia*, which are striate-nerved as in the genus *Cyrtorrhynca.*

Delphinium Columbianum. *D. Nuttallii*, Gray, Bot. Gaz. xii. 51 and 54 (1887). Nuttall's *D. pauciflorum* being at the time of its publication several times a homonym, was altered by Pritzel at once into *D. Nuttallianum;* and this will preclude the *D. Nuttallii* of Gray.

CAPNOREA, Rafinesque.

Hesperochiron, S. Wats. Bot. King. 281 (1871) was published as a new genus, under the name *Capnorea* by Rafinesque, in the Flora Telluriana as early as 1836; so that the Watsonian name inevitably falls into synonymy. The species at present recognized are fortunately few.

C. NANA, Raf. Fl. Tellur, iii. 75 (1836). *Nicotiana nana*, Lindl. Bot. Reg. x. t. 833 (1824). *Ourisia Californica*, Benth. Pl. Hartw. 327 (1849). *Hesperochiron Californicus*, S. Wats. l. c. *H. nanus*, Greene, Bull. Torr. Club. xv. 110. Here also probably belongs *H. latifolius*, Kellogg.

C. ciliata. *Hesperochiron ciliatus*, Greene, Pitt. ii. 282 (1889).

C. pumila. *Villarsia pumila* (Dougl. *sub* Menyanthide), Griseb. in Hook. Fl. ii. 70, t. 57 (1838). *Hesperochiron pumilus*, Porter in Hayd. *Geol. Rep.* 768 (1872).

Opulaster monogynus. *Spiræa monogyna*, Torr. Ann. Lyc. N. Y. ii. 194 (1827). For further synonymy see Pittonia ii. 29.

Opulaster malvaceus. *Neillia malvacea*, Greene, Pitt. ii. 30 (1889).

TRADITIONAL INTERPRETATION OF LINNEAN NOMENCLATURE.

By Dr. Saint-Lager.[1]

In several of my earlier papers, particularly those treating of the vicissitudes of Globularia, and the polymorphism of the Bupleura, I have shown that Linnean nomenclature could easily be thrown into confusion—especially as regards specific names applied to polymorphous types—if the fact that these names designate the collection of forms, and not one in particular, were not borne in mind, nor the excessive brevity of diagnoses in the *Species Plantarum* taken into consideration. I now contribute a further example of the unsound position to which a too rigid interpretation of the text of this work might lead.

Under the heading of *Spergula pentandra*, Linné made no mention of the variety described by Morison.[2] As this latter is the only form of *Spergula pentandra* occurring in Sweden and Norway, the omission is the more surprising. Moreover, there is room to believe that the specimens contained in the Linnean herbarium, and from which the description in the *Species Plantarum* was drawn, were gathered in Scandinavia.[3]

Therefore those botanists who do not allow any derogation of the rule of priority in favor of a usage, however old and widespread, will not hesitate to insist that the customary application of the Linnean name *Spergula pentandra* be changed, and that a new name be created for the plant which up to the present has been considered the typical form. The appellation *Spergula Morisonii* must then disappear from nomenclature.

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[1] From *La Guerre des Nymphes, suivre de la Nouvelle Incarnation de Buda*, chap. 3 "Spergula et Agrostis," pp. 33-39. Paris, 1891, 39 pp. 8 vo. Translation and footnotes by J. Burtt Davy.

[2] *Spergula Morisonii*, Boreau.

[3] Therefore, that the typical *S. pentandra*, and *S. Morisonii*, Bor., are the same thing.

Perhaps my readers will be tempted to charge me with recurring to the method of the polemic, who gratuitously attributes extravagant views to his adversaries, in order to have the malicious and readily obtained pleasure of disputation.

But I do not at all overstate the case. The aforesaid proposition has actually been made by Timbal-Lagrave, as M. Ant. Legrand tells us in his *Statistique Botanique du Forez*, p. 92: "M. Timbal-Lagrave points out to me that *Spergula Morisonii* is the only species occurring in Sweden, and that it, therefore, is the true *Sp. pentandra* of Linné. He proposes to restore the Linnean name to the plant of Boreau, and to give to *Sp. pentandra* of French authors the name of *Sp. Borœi.*"

I note with pleasure that M. Legrand has had the wisdom not to follow the suggestion of the Toulouse botanist and that he has maintained the long accepted nomenclature, not only in the *Statistique Botanique du Forez*, but again in his *Flora du Berry*, published in 1887 (p. 42).

In my pamphlet on the polymorphism of the Bupleura, I have shown that the significance of certain specific names has been interpreted falsely because the sense of these appellations has been restricted to the particular form found in the Linnean herbarium, without taking account of the references given in the *Species Plantarum*. The illustrious Swede, I pointed out, not being able to foresee the use which would later be made of his collection of dried plants, prepared it with extreme negligence, and very often placed therein rare plants only, omitting to add the common forms. It is through relying upon the fallacious data of this collection that certain botanists have come to restrict to a particular form of each, and that usually the rarest, the application of the names *Ranunculus chærophyllus* (southern form *flabellatus*), *Helleborus viridis* (form *orientalis*), *Bupleurum Odontites* (oriental form of *B. aristatum*), *Globularia vulgaris* (form from the Swedish Islands), *Melica ciliata* (form of the north of Europe), etc., etc.

I will now cite another example of the errors to which those botanists are liable who accord a higher value to the labels of the Linnean herbarium than to the descriptions and references contained in the *Species Plantarum.* The particular case of which I will now speak, relates moreover to the question of priority raised *apropos* of *Castalia*, *Buda*, *Tissa*, and *Spergula*.

Among the Gramineæ, there is none more widely distributed all over Europe than the *Agrostis* called *vulgaris* by Withering in his *Arrangement of British Plants* (3 ed. p. 132, published in 1796). In this case no one dare assert that Linné did not know and did not name so common a plant. I will venture further and say that the Linnean name is *Agrostis capillaris.* Why then have authors unanimously adopted the name *Agrostis vulgaris*, given by Withering in 1796, contrary to the so-called inviolable rule of priority?

The instigator of this flagrant violation of Linnean tradition was this same Smith,[4] who, nevertheless, had the good sense, some years later, to repudiate the useless innovations proposed by his compatriot, Salisbury, *apropos* of *Nymphæa.* During his revision of Linné's herbarium, which he had carried in triumph from Upsala to London, Smith ascertained that the sheet labelled *Agrostis capillaris*, carried, not the plant which all botanists were calling by that name, but a variety of it, which Linné had never described and of which the origin is unknown.

By the description and figure which have been given of it, first by Smith (*Icon. ined.*, fasc. 3, tab. 54), then by Trinius (*Agrostidea*, p. 109, *Icon.*, tab. 25), it is seen to differ from the type in its smaller stature, straighter and more glabrous leaves, slender and glabrous floral axis, and smooth and nerveless glumes. For this plant alone, modern agrostographers, following Smith, reserve the appellation *Agrostis capillaris.* It is believed to be the plant named *Agr. delicatula* in the *Chloris Hispanica* of Pourret. To this day it has been found only in certain localities in Portugal and Spain. But it is well to know that under the name of *Agrostis capillaris* some authors have confounded two neighboring species, one having glumes glabrous as those of the plant in the Linnean collection, the other having hispid glumes (*Agr. hispida,* Brot., *A. truncatula,* Parlat., *A. capillaris,* Boissier.)

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[4] Sir J. E. Smith, mentioned earlier in the pamphlet.

It is certain that from the year 1753, the date of publication of the *Species Plantarum,* until the end of the 18th century, all botanists (except Haller, who, from jealousy, refused to adopt the binary nomenclature) have rightly designated as *Agrostis capillaris,* that grass which is common in all countries of Europe and which we call *Agr. vulgaris,* With., and not the aforesaid Spanish plant, of which none of them suspected the existence. It is, in fact, under the denomination *Agrostis capillaris,* L., that this polymorphous species is mentioned without distinction of forms, in the works of the following authors:

Jacquin, *Enumer. Stirp. Vindob.,* 13 (1762): Gouan, *Flora Monspeliaca,* 118 (1765): Crantz, *Instit. Rei Herbar.* i. 365 (1766): Œder, *Flora Danica,* tab. 163 (1766): Schreber, *Spicilegium Floræ Lipsicæ,* 48 (1771): Reichard, *Flora Mœno Francof.,* 14 (1772): Scopoli, *Flora Carniol.* ii. p. 1, p. 61 (1772): Leers, *Flora Herborn.,* 20, tab. 4, fig. 3 (1775): Pollich, *Hist. Plant. Palatin,* i. 69 (1776-77): Lamarck, *Flore Franc.,* iii. 573 (1778); *Encycl. Méth.* i. 59 (1783): Retzius, *Floræ Scandin. Prodr.* 14 (1779): Allioni, *Flora Pedemont.,* ii. 237 (1785): Villars, *Hist. Pl. Dauph.,* ii. 73 (1786-89): Roth. *Tent. Floræ Germ.,* i. 85 (1788): Baumgarten, *Flora Lipsiensis,* 43 (1790): Lumnitzer, *Flora Poson.,* 32 (1791): Host, *Synops. Plant. Austr.,* 42 (1797); *Icon. Gramin. Austr.,* 59 (1801): Gilibert, *Hist. Plant.*

Europe, i. 22 (1798): Desfontaines, *Flora Atlant.* i. 69 (1798): Thuillier, *Flore Envir. Paris*, 2 ed., 35 (1799): Kœler, *Descr. Graminum*, 89 (1802): Roucel, *Flore du Nord France*, i. 49 (1803): Mouton-Fontenille, *Système des Plantes*, i. 114 (1804).

It is incomprehensible that the consideration of such unanimity in interpreting the specific name *Agr. capillaris*, did not deter Smith from his unfortunate idea of according to an herbarium label greater value than to a tradition uninterrupted for nearly half a century.

Linné lived till 1778, consequently he must have allowed his contemporaries to propagate a false interpretation as to the sense of the expression *Agr. capillaris* for twenty-five years (1753-78) without protestation. How is it that he did not say to them: You are mistaken, for under this name I wished to speak of an *Agrostis* sent to me from Portugal by Lœfling. The *Agrostis* which you call *capillaris* is my *Agr. stolonifera.* In short, it is inadmissible that none of his pupils nor correspondents, who well knew the opinion of the master concerning one of the commonest of plants, did not raise a protest if it had been incorrectly re-published by all the authors of Floras.

During the three centuries which preceded ours, tradition had a much greater importance than contemporary botanists who have at their command works containing accurate and complete descriptions, and the finest iconographies, would give credit for. Formerly it was extremely difficult, and often impossible, to determine certain plants, notably the grasses, by books. To give an idea of this difficulty, it wlll be sufficient to reproduce the description, considered as classical from 1620 to 1753, of the grass which we at present call *Agrostis vulgaris*:

"*Gramen montanum panicula spadicea delicatiore.*

"Radice est alba, brevi capillacea, culmis ternis, quaternis, geniculatis, pedalibus, uno alterove folio cinctis, quæ etiam ad radicem brevia et pauca sunt; in culmorum summo panicula triuncialis, spadicei coloris, ex locustis minimis composita.

"Hoc tamen variat magnitudine, cum et caule sesquicubitali et spica semipalmari inveniatur; provenit locis saxosis, *majus* quidem in monte Crentzacho; *minus* vero in monte Wasserfall dicto."—C. Bauhin, *Prodromos Theatri Botanici*, p. 6, xii.

The description in two lines given by Linné in the *Species Plantarum* is still less explicit:

"*Agrostis capillaris.*—A panicula capillari patente, calycibus subulatis æqualibus hispidiusculis coloratis, flosculis muticis.

"Royen *Lugdb.*, 59. Dalibard *Fl. Paris.*, 23.—A panicula tenuissima *Flor. Lapp.*, No. 45, Gramen montanum, panicula spadicea delicatiore C. Bauh. *Pinax* 3, *Prodr.* 6, xii. Scheuchzer, *Gramin.*, 129.

"Habitat in Europæ pratis."

From this incomplete description, which is applicable to every species of the group, it would be very difficult to recognize our *Agrostis vulgaris* with certainty.

Yet, since Linné said that *Agr. capillaris* grew "in the meadows of Europe," he evidently was not speaking of a rare plant, only known as occurring in certain localities of Portugal and Spain, but, clearly, of the common *Agrostis* described by Caspar Bauhin, and afterwards mentioned under the same rubric by Royen, by Dalibard and by Scheuchzer who are cited by Linné.

On account of the insufficiency of the descriptions, it was absolutely necessary, during preceding centuries, that the knowledge of plants should be directly taught by the masters to their pupils, then transmitted little by little by the latter to other botanists. It is surprising that Smith, living at the end of the 18th century, and who ought consequently to have known better than we, the necessity for this didactic dissemination of knowledge, should have forgotten the importance of tradition, without which the greater part of the Linnean diagnoses would very often be insoluble enigmas.

Thus Wulfen, relying upon the long-held tradition which existed from 1753 up to, and even beyond, 1796, had good ground for declaring (*Flora Norica*, p. 89) that the argument brought forward by Smith was indefensible. And Richter, likewise, has asserted (*Codex Linnæanus*, p. 77), that Smith violated the elementary rules of criticism when he changed the acceptation of the Linnean name *Agrostis capillaris*.[5] In reality, since he deals with the question of nomenclature, it is not in the *Flora Lapponica* (1737) nor in the *Flora Suecica* (1745) that one should seek the interpretation of the specific name *Agr. capillaris*, for in these two works Linné had not begun to use *nomina trivialia*. I add that neither is it in the incomplete and badly arranged herbarium of the illustrious reformer, for as Hartman has stated (*Botan. Notiser*, 1840), the specimens of *Agrostis vulgaris* are labelled *Agrostis rubra*, and it is impossible to find an agreement between the labels and the text of the *Species Plantarum* for the other species of this genus. Therefore, as Nyman has remarked (*Sveriges Fanerogamer*, p. 516), one ought not to be surprised if the synonymy of *Agrostis stolonifera*, *alba* and *capillaris* should be a perpetual subject of controversy among botanists.

Decidedly, since the herbarium of Linné has up to the present day only served uselessly to disturb nomenclature, it will be advisable to leave this venerable and fallacious relic to rest undisturbed in the closets of the Linnean Society of London.

It will also be admitted that the text itself of the *Species Plantarum* is of value only with the tradition which has interpreted the sense of it.

Finally, although it be proven by tradition that *Agrostis capillaris*, Linn., is synonymous with *Agr. vulgaris*, With., I hope that botanists will energetically resist the attempts which the strict partisans of priority would make to expel the latter as a usurper, even as they ought to oppose the re-animation of the ghosts which are called *Castalia*, *Buda* and *Tissa*.

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[5] "Planta *Fl. Lapp.* a Wahlenbergio dubie ad *Agrost. alpinam* citatur quae certe vulg. in Lapponia; cf. ejusd. W. *Fl. Lapp.* p. 22, p. 24-25!

"Verum inde a Roy. *Lugdb.* vix usquam dubia planta: certissimeque *A. vulgari*, With. (*A. hispidæ*, Willd.) syn. est ="*A. capillaris*, L. (excl. syn. *Fl. Lapp.*)" contra criticæ leges nomina permutavit Sm., quum nomina trivialia non imposita sint in *Fl. Lapp.*, nec liqueat, unde planta herbarii orta." Richter, op. cit.

Since changes are prejudicial to clearness of language and consequently are contrary to the spirit of the law which rules nomenclature, it is important to preserve faithfully, old and generally accepted practices when they are not manifestly at fault. My opinion in this respect is the more impartial that I am partisan to useful reforms, as my previous writings prove.

MISCELLANEOUS NOTES AND NEWS.

SIGNATURE 22 of the A. A. A. S. Botanical Club's official list of Northeastern American plants, has just reached us. The inexcusable blunder of printing "Aarduus" for Carduus ten times on p. 344 would be merely laughable were it found anywhere but in a scientific work. All have a right to expect greater pains in producing what is intended to be an "official" check list, a complete and accurate book of reference to be in constant use by Eastern botanists. We suppose that a correction of this and other errors will appear at the end of the book, but we fear such a correction will not suffice to keep *Aarduus Hillii* (Canby) Porter, from being treated as a name by those botanists who would maintain *Scoria* instead of *Hicoria*. The very fact that such botanical writers are to be found should alone make us more careful to avoid misprints.—J. B. D.

SEVERAL parts of the "Systematic Botany of North America" are announced for 1895. Vol. IX., Part 1, Hepaticæ by L. M. Underwood will appear in January. Other parts to follow are: Vol. V., Parts 1 and 2, Pyrenomycetes, by J. B. Ellis and B. M. Everhart; Vol. X., Part 1, Typhaceæ, Sparganiaceæ, Naiadaceæ, Juncaginaceæ, Alismaceæ, Hydrocharitaceæ, by the late Thomas Morong; Vol. XI., Parts 1 and 2, Cyperaceæ by N. L. Britton and L. H. Bailey. The following extract from the first circular letter of the Board of Editors regarding this important undertaking will, in view of the early publication of some of the parts, be of interest. "The general sequence of orders will be based on that adopted by Professors Engler and Prantl in their "Naturliche Pflanzenfamilien" now approaching completion, and the work will be divided into seventeen volumes, and issued in parts averaging about 100 pages each. About five of these parts will constitute each volume. No illustration is contemplated, but copious references to published plates and figures will be made a feature. In addition to the technical characterizations, chapters dealing with the economic, palæontologic and horticultural aspects of each order will be appended. Especial attention will be given to the verification of original descriptions, to the examinations of type specimens, to the citations of type localities and to geographical distribution. Each monographer will be responsible for his own matter, the only restrictions placed on contributors being that they conform to a general style, and to principles of nomenclature and citation, and that descriptions be extended only to an average limit of a certain number of words. It is expected that an approximately uniform consideration of species can be secured." N. L. Britton of Columbia College is the Chairman of the Board of Editors. The other editors are George F. Atkinson, Cornell University; Frederick V. Coville, U. S. Department of Agriculture; Arthur Hollick, Columbia College; Edward L. Greene, University of California; John M. Coulter, University of Chicago; Byron D. Halsted, Rutger's College; Lucien M. Underwood, De Pauw University. The co-operation of a large number of botanists has been secured and it is hoped to complete the work within fifteen years.

ERRATA.

Page 15, line 7, for fascination read fasciation.
" 24, " 7, " Phytolaca read Phytolacca.
" 34, " 2, " enchancing read enhancing.
" 77, " 24, " Torr. Frem. read Torr. and Frem.
" 79, " 5, " Papapaver read Papaver.
" 80, " 14, " fruiting read fruit ripe.
" 86, " 16, " the attempt make read the attempt to make.
" 96, " 5, " headquarters read headwaters.
" 98, " 10, " synonomy read synonymy.
" 103, " 1, " 1836 read 1846.
" 117, " 14, " alwags read always.
" 152, " 5, " foraminibis read foraminibus.
" 152, " 10, " tubulosis read tubulosus.
" 152, " 19, " Rhinanthaceo read Rhinanthacea.
" 153, " 18, " Californæ read Californiæ.
" 154, " 20, " acurate read accurate.
" 184, " 15, " var. E. read var. ϵ.

INDEX.

New Species and New Names.

Æcidium Clarkiæ, 129
Amphisphæria nuda, 18
Amsinckia barbata, 192, microcarpa, 191
Aposphæria herbicola, Kansensis, Oxybaphi, 24
Biscutella Californica maritima, 179
Brachychæta sphacelata, 58
Camarosporium Negundinis, 24
Capnorea ciliata, pumila,
Cercospora clavicapa, fuliginosa, 26
Chrysopsis Berlandieri, 96, Columbiana, pumila, 95, Rutteri, stenophylla, 96, viscida, 105
Cryptospora Kansensis, 21
Cylindrosporium Negundinis, 25
Delphinium Burkei, 183, Columbianum, camporum, 183, Emiliæ, 120, Geyeri, 189, tenuisectum, 184
Diplacus speciosus, 101
Diaporthe Amorphæ, 21
Didymosphaeria graminicola, 19
Dothidea Cercocarpi, 22
Ericameria cuneata, monactis, 124
Erigeron Mendocinus, 106
Eriocarpum australe, 108, Coloradense, 110, junceum, 108, gracile, gymnocephalum, 109, scabrellum, spinulosum, 108
Eschscholtzia cucullata, 120
Fissidens pauperculus, 97
Frullania Asagrayana alsophila, Franciscana, 99
Galium grande, occidentale, 124
Glœosporium Cercocarpi, 25
Hadotrichum Heteromelis, 26
Hazardia cruenta, Berberidis, Orcuttii, squarrosa, 112
Hemitomes pumilum, 121
Hysterographium Kansense, 22
Isocoma acradenia, coronopifolia, Drummondii, Hartwegi, heterophylla, pluriflora, tridentata, veneta, 111
Kumlienia Cooleyæ
Leptosphæria occidentalis, 20
Lupinus fallax, Michenerii, 119
Macronema Greenei, molle, pygmæum, 73, Watsonii, 74
Macrophoma Negundinis, 23
Melanconium Celtidis, 24
Melanomma rhypodes, 17
Melanopsamma Kansensis, 17
Metasphæria gaurina, 21
Œnothera rutila, 62
Phacelia leptostachya, 190, umbrosa, 191
Phyllosticta turmalis, 23
Pinus Apacheca, 103, contorta Bolanderi, contorta Hendersoni, 176
Pleospora diplospora, 20, hysterioides, 19
Puccinia McClatchieana, 127, palefaciens, punctiformis, recondita, 128
Pyrrocoma apargioides, 70, crocea, 69, Cusickii, 59, hirta, 69, Howellii, 70, integrifolia, 69, inuloides, 60, lanceolata, tenuicaulis, 69, uniflora, 60
Ramularia Meliloti, 26
Ranunculus Drummondi, 194, Harveyi, hesperoxys, 189
Ribes amarum, hesperium, 79, nubigenum, 80
Rhopographus fusariisporus, 23
Senecio ilicetorum, 85

Septogloeum Convolvuli, 25
Solidago Parryi, 57, Parryi minor, 57
Stachys stricta, 122, velutina, 121
Stenotus interior, lanuginosus, stenophyllus, 72
Teichospora fulgurata, 18
Trematosphæria hyalopus, 18
Trifolium lacerum, 182, Monoense, 181, pinetorum, 182, productum, 181
Tropidocarpum dubium, 179
Uredo laeviuscula, Pteridis, 127
Wulfenia alpina, Houghtoniana, pinnatifida, plantaginea, 83, rotundifolia, 82, rubra, 83

Authors, Genera, Topics, etc.

Acæna trifida not Californian, 5
Acamptopappus, 107
Achyrachæna, reprint of original description of the genus, 186, and of the species A. mollis, 187
Achyrodes aureum, contribution to the history of, 113
Adiantum, 77
Æcidium, 129
Agrostis, 78
Allocorya Californica. See Myosotis Californica
Allium, 129
Alsine, 79
Amarantus, 79
Amellus, 94, 108
Ammodia, 76, 105
Amole, 10
Amorpha, 21
Amphisphæria, 18
Amsinckia, 192; intermedia, and spectablis, transcript of the original descriptions, 136-7
Amygdalus, 62
Andropogon, 19, 30, 77
Anemone, 133
Anemopsis Californica, medicinal properties of, 69
Anethum, 49
Anogra, 16
Antirrhinum, 82
Aplopappus, 54, 69, 107, 124
Aposphæria, 24
Aquilegia, 63; truncata, transcript of original description, 170
Arabis, 128, 178
Arbutus, 121; Menziesii on Mt. Wilson, 83
Arenaria, 63
Aristida, 78
Arnicella, 72
Artemisia, 61, 128
Asclepias, 20, 63
Asperula, 133
Asplenium, 77
Aster, 54, 69, 107, 125
Astereæ, 53
Astragalus, 64
Atelianthus, 83
Atenia, 51
Atriplex, 61, 78
Avena, 78
Baccharis, 111
Baeria, transcript of original description of genus and of species B. chrysostoma, 137
Bahia arachnoidea, transcript of original description, 169

Bailey, L. H., another side of the nomenclature question, 10
Bast fibres, note on the uncultivated, 188
Betckea major, transcript of original description, 138
Bigelovia, 54, 111
Big Rock Creek, Los Angeles County, 61
Bioletti, F. T., an experience in herbarium making, 31
Biscutella, 179
Blepharipappus platyglossus. See Callichroa platyglossa, 139
Blochman, Ida M., Californian Herb-lore, 9, 39, 162
Boisduvalia, 16; densiflora imbricata, fasciation in, 15
Bolander, H. N., his tree discoveries on the Mendocino plains, 157
Bonarota, 81
Botanical Society of America, organization of, 188
Botanical survey of the upper Sacramento region, 142, of Nebraska, 158
Botanic technic, an abbreviation in, 40
Brachychæta, 58, 107
Brachyris, 56
Britton, N. L., concerning Professor Greene and Jacksonia and Polanisia, 67
Bromus, 78
Brunete, Joseph, 3
Buda, 196
Buplerum, 196
Callichroa, transcript of original description of genus, 138, and of species C. platyglossa, 139
Calochortus, 62, 64; field notes on, 2, 27; hybridization in, 52
Caltha, 193
Camelina sativa as an oil bearing plant, 156
Canchalagua, 40
Canutillo, 162
Capnorchis, 63
Capnorea, 193
Caprifolium, 133
Cardamine, 178
Carex, 78
Carum Gairdneri, concerning the correct citation of, 50
Castilleia, 62
Catalina Island, additions to the Flora of, 76
Caucalis, 123
Caulanthus, 63, 178
Ceanothus, 26, 62
Celtis, 18, 24
Cerasus, 64
Cercocarpus, 22, 25
Chamisso Botanical Club, sketch of its history and purposes, 171
Chenopodium Californicum, economic uses of, 10
Chili Cojote, 9
Chloris, 197
Chlorogalum pomeridianum, economic uses of, 10
Chrysoma, 57
Chrysopsis, 54, 71, 89, 91, 105
Chrysurus, 115
Chylismia, 16
Citations needing correction, 48
Clarkia, 129; concinna. See Eucharidium concinnum; grandiflora. See Eucharidium grandiflorum
Claytonia gysophiloides and perfoliata, transcript of original descriptions, 139, 153
Cleome, 6, 67
Collinsia, 82; sparsiflora, transcript of original description, 139
Compositæ, observations on, 53, 69, 89, 105
Coniferæ, notes on West American, 102, 157, 173

Conium, 123
Convolvulus, 25
Corethrogyne, 30, 112
Cornus, 30, 123
Cotyledon, 79
County lists in England, additions to, 142
Croton Californicus, use of its leaves as a remedial agent, 163
Cruciferæ of Los Angeles County, 177
Cryptanthe leiocarpa. See Echinospermum leiocarpum
Cucurbita foetidissima, economic uses of, 10
Cupressus, 103
Cycladenia, 123
Cylindrosporium, 25
Cynosurus, 116
Cyperus, 78
Cyrtorrhynca, 193
Cystopteris, 77
Davidson, Anstruther, notes on Calochortus, 1, 27; new records for Catalina Island, 30; on Big Rock Creek, 61; northern species near Los Angeles, 83; Cruciferese of Los Angeles County, 177
Davy, J. Burtt, some citations needing correction, 48; a new species of Diplacus, 101; contribution to the history of Achyrodes aureum, 113; transcripts of some descriptions of Californian genera and species, 136, 148, 164, 185; translation of Dr. Saint-Lager's "Spergula et Agrostis," with notes, 194
Delphinium, 120, 183, 190; decorum, transcript of original description, 153
Dendromecon rigidum, reversion in, 14
Dietel, P., new Californian Uredineæ, 127
Dieteria, 107
Diplogon, 74, 93
Diplopappus, 75, 93, 95, 108
Discosia, 24
Distichlis maritima, its use in domestic medicine, 163
Dombey, Joseph, 3
Donia, 60, 69
Dothidia, 22
Douglas, David, discoveries of new northwestern Coniferæ, 102
Dryopteris spinulosa dilatata, its discovery in California, 51
Echinospermum leiocarpum, 166; transcript of the original description, 140
Ellis, J. B., new West American Fungi, 17
Elymus, 78
Encina, 47
Endosmia, 50
Ephedra Californica, its use in domestic medicine, 162
Epilobium, 123
Epipactis, 62
Equisetum, 122
Eragrostis, 78; E. Eragrostis, synonomy and history of, 37
Ericameria, 71
Erigeron, 58, 94, 106, 125
Eriocarpum, 107
Eriogonum, 78
Eriophyllum, 169; arachnoideum. See Bahia arachnoidea
Eritrichium Californicum. See Myosotis Californica
Erythræa, 63; Douglasii, medicinal properties of, 40
Eschscholtzia crocea, example of fasciation in, 14
Eucharidium, transcript of original description of genus and of species E. concinnum, 140, and grandiflorium, 165
Eupatorium, 135

Euphorbia, 30, 63; dictyosperma, transcript of original description, 148
Euthamia, 56
Eutoca Wrangeliana, transcript of original description, 148
Everhart, B. M., new West American Fungi, 17
Evolution of the Hepaticæ, note on Professor L. M. Underwood's American Association address, 172
Field notes, Californian, 1, 27, 61, 83
Fissidens, 97
Forestiera, 63
Frasera, 63
Fraxinus, 18
Fremontodendron, 63
Frullania, 97
Fungi, new West American, 17
Fusarium, 23
Galium, 63, 124
Galvez, Isidro, 3
Garrya, 123
Gastridium, 30
Gaura, 21
Gayophytum, 63
Gilia, 62, 64; millefoliata, transscript of original description, 164
Githopsis diffusa on Mt. Wilson, 84
Globularia, 196
Glycyrrhiza, 62
Glyptopleura, 62
Gnaphalium, 125
Gnaphalodes Californica. See Micropus Californicus
Godetia, 16
Gomphocarpus, 63
Greene, E. L., concerning Dr. Britton, Mr. Britten and Jacksonia, 6; correct nomenclature, etc., 12; note on Raimann's revision of the Evening Primrose family, 16; review of Thomas Morong's "Notes upon various species of Iridaceæ and other Orders," 34; review of F. V. Coville's "Botany of the Death Valley Expedition," 35; historical notes upon some Californian trees, 43, 64; note on Sambucus cœrulea, 52; observations on the Compositæ, 53, 69, 89, 105; Jacksonia but not Polanisia, 68; American species of Wulfenia, 80; editorial on commercial values in botany, etc., 85; Novitates Occidentales, 119, 181, 189; corrections in nomenclature, 192
Gutierrezia, 56
Gymnandra, 81
Hansen, Geo., probable hybridization in Calochortus, 52
Hawkweeds, note on the publication of new British, 158
Hazardia, 112, 124
Heleniastrum, 125; puberulum, its use in domestic medicine in Southern California, 163
Helleborus, 196
Hepaticology, chapters in the early history of, 130, 143
Herbarium making, an experience in, 31
Herb lore, Californian, 9, 39, 162
Hesperochiron, 193
Heteromeles, 26
Hetherotheca, 89
Heuchera pilosissima, transcript of original description, 165
Heyfeldera, 90
Hicoria, 68
Hitchcock, A. S., Eragrostis Eragrostis, 37
Holcus, 78
Holm, application to certain Californian oaks, 46

Hologymne, 167; Douglasii, transcript of original description, 168
Homopappus, 58, 69
Hoorebekia, 58, 70
Hordeum, 78
Howe, Marshall A., a fern new to California, 51; notes on California bryophytes, 97; chapters in the early history of Hepaticology, 130, 143; note on Professor Underwood's American Association address, 172
Hybridization in Calochortus, 52
Hypochæris, 125
Hysterionica, 75
Hysterium, 23
Inula, 74, 91
Iris, 34
Isocoma, 110
Iva, 63
Jacksonia, 6, 67
Jepson, W. L., teratological notes, 14; Professor Greene's mission in Europe, 153; Odontostomum Hartwegi, 157; Chamisso Botanical Club, 171
Juncus, 62, 78
Kneiffia, 16
Krynitzkia, transcript of the original diagnosis of the genus and citation of type, 166; leiocarpa. See Echinospermum leiocarpum, 140
Kumlienia, 193
Kunzia, 62
Lamarkia, 114
Larrea, 61
Lasthenia chrysostoma. See Baeria chrysostoma
Lavauxia, 16
Layia, 138; platyglossa. See Callichroa platyglossa
Lejia, 163
Lemmon, J. G., old and new species of West American Coniferæ, 102; the promontory pines of Mendocino, 157; the thimble-cone pines, 173
Lemna, 78
Lepidium, 178
Lepidostephanus madioides, transcript of original description, 185
Leptosphæria, 21
Lessingia, 107
Linosyris, 111
Lœflingia, 79
Lophotocarpus, notice of a revision of, 141
Los Angeles County, additions to the flora of, 76, Cruciferæ of, 177
Lotus, 63; Wrangelianus, transcript of original description, 149
Lupinus, 62, 119
Machæranthera, 107
Macronema, 71, 90
Madia sativa as an oil bearing plant, 157
Malva parviflora, its use in domestic medicine, 163
Malveopsis, 63
Manzanilla, 40
Marchantia polymorpha, 131, 143
Matricaria discoidea, its use in domestic medicine, 40, 163
Matrissylva, 133
McClatchie, A. J., additions to the flora of Los Angeles county, 76, 122; additions to the flora of Catalina Island, 122
Megapterium, 16
Melanomma, 17
Melanopsamma, 17
Melica, 196
Melilotus, 26
Mendocino, the promontory pines of, 157

Meriolix, 16
Michener, C., Ruiz and Pavon's journeys in South America, 3; publication of varieties, 13; an abbreviation in botanic technic, 40
Micromeria barbata, 167; transcript of original description, 168
Micropus Californicus, transcript of original description, 149
Mimulus, 63
Minnesota Botanical Studies, notice of, 141
Miscellaneous notes and news, 15, 141, 158, 188, 201
Mollugo, 123
Monardella, 63
Monolopia, 168
Montia gysophiloides, 139
Morina, 167
Muhlenbergia, 78
Musenium, 50
Myagrum sativum, 157
Myosotis Californica, transcript of original description, 149
Myrianthus, 60
Nasturtium, 178
Negundo, 23, 25
Neillia, 194
Nemophila atomaria, transcript of original description, 150
Nicotiana, 62
Nomenclature question, another side of, 10; correct nomenclature, 12; corrections in nomenclature, 192; traditional interpretation of Linnæan nomenclature, 194
Northern species near Los Angeles, 83
Notholæna, 77
Novitates Occidentales, 119, 181, 189
Observations on the Compositae. See Compositae.
Odontostomum Hartwegi, 157
Œnothera, 16, 62, 123; strigulosa. See Sphærostigma strigulosa.
Oidium, 26
Oil-bearing plants, notes on two, 156
Onagra, 16
Open letters, 10, 67
Opuntia, 62
Orthocarpus, 152; versicolor. See Triphysaria versicolor
Osmorhiza, 51
Ourisia,
Oxybaphus, 24
Pachylophis, 16
Pæonia Californica, its use in domestic medicine, 163
Panicum, 19, 20, 23
Papaver, 79, 156
Pavon. See Ruiz
Pedicularis, 64
Pentachæta, 107
Pentstemon, 82
Peucedanum Kingii and graveolens, correct citation of, 48
Phacelia, 64, 148, 190
Phoma, 22
Phoradendron, 63
Phytolacca, 24
Picea, 103
Platystemon leiocarpum, transcript of original description, 150
Plectritis, 138; brachystemon, transcript of original description, 150
Pinus, 63, 77, 103, 157, 173; Bolanderi, 158; contorta, 158, 174, varieties of, 175; muricata, 159; Murrayana, 175
Pityopsis, 90, 93
Pleospora, 19
Poa, definition of the genus by Linnæus, 37
Polanisia, 6, 68

Polygala, 123; cornuta on Mt. Wilson, 84
Polygonum, 78
Polypodium, 127
Polypogon, 77
Potentilla, 64; glandulosa, 30, 166; Wrangeliana, transcript of original description, 166
Primrose family, note on Raimann's revision of, 16
Pseudotsuga, 103, 175
Pteris, 127
Pterium, 115
Pterostegia, reprint of the original description of the genus and of the species P. drymarioides, 151
Ptiloria, 26
Publication of varieties, 13
Salvia, 62
Sambucus cœrulea, 52, glauca, its use in domestic medicine, 40
Sanicula, 123
Sauco, 40
Saxifraga, 79
Scirpus, 78, 128
Scutellaria, 63
Selinum, 64
Senecio, 64, 84
Septoria, 25
Sericocarpus, 56, 107
Sideranthus, 75, 94
Silene, 63, 79
Sisymbrium, 63, 178
Sisyrinchium, 34
Sium, 123
Sneezeweed, 163

Trees, historical notes on some Californian, 43, 64
Trematosphæria, 18
Trifolium, 133, 164, 181; physopetalum, transcript of original description, 164
Triphysaria, reprint of original description of the genus and of the species T. versicolor, 152
Tropidocarpum, 180
Ulmus, 17
Uredo, 127
Valerianella, 138, 150
Vancouver at San Francisco, 45; in the Santa Clara Valley, 47
Velæa, 64
Venegaz, Father, notice of some Californian trees, 46
Trisetum, 78
Veronica, 81, 124
Villarsia, 193
Vitis, 23
Waltmeister, 133
Wulfenia, American species of, 80
Xanthium, 125
Xylopleurum, 16
Yerba Mansa, 39
Yucca, 61
Zauschneria, 129